The EXCAVATING ENGINEER

Vol. XXIII APRIL 1929 No. 4

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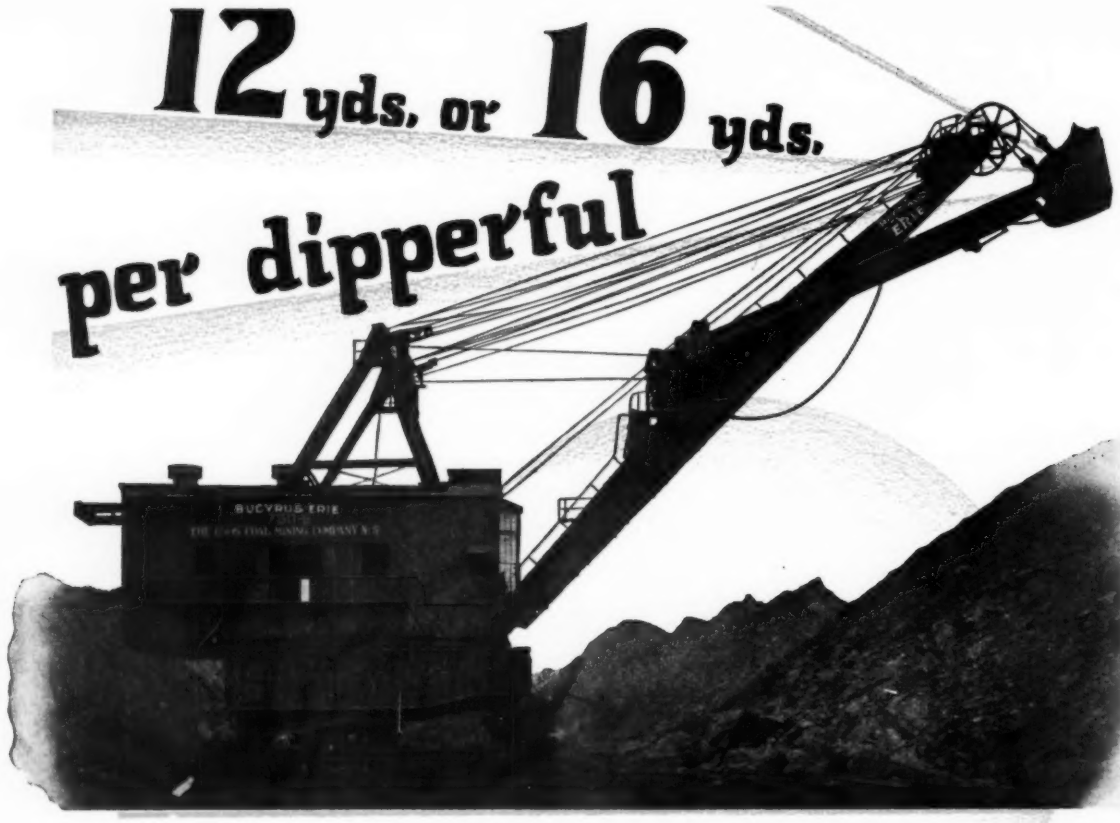
The R. C. Huffman Construction Company Transform Lake Erie Marsh Into 5½ Million Dollars Worth of Real Estate.

The Most Remarkable Electrical Development for Shovels.

Winning the Clay at Bohnsack Brick Plant.

Front Cover Illustration: Great Lakes Dredge & Dock Company's fleet building fill for the Sandusky Bay Bridge as seen from the Danbury side.

12 yds. or 16 yds. per dipperful



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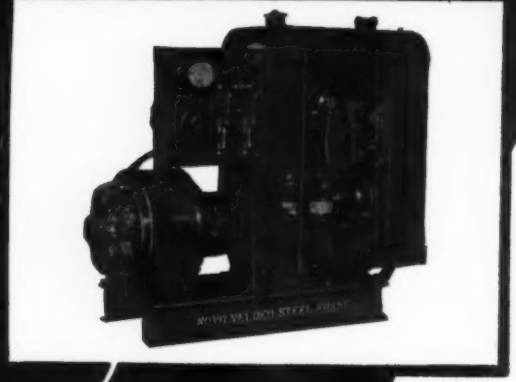

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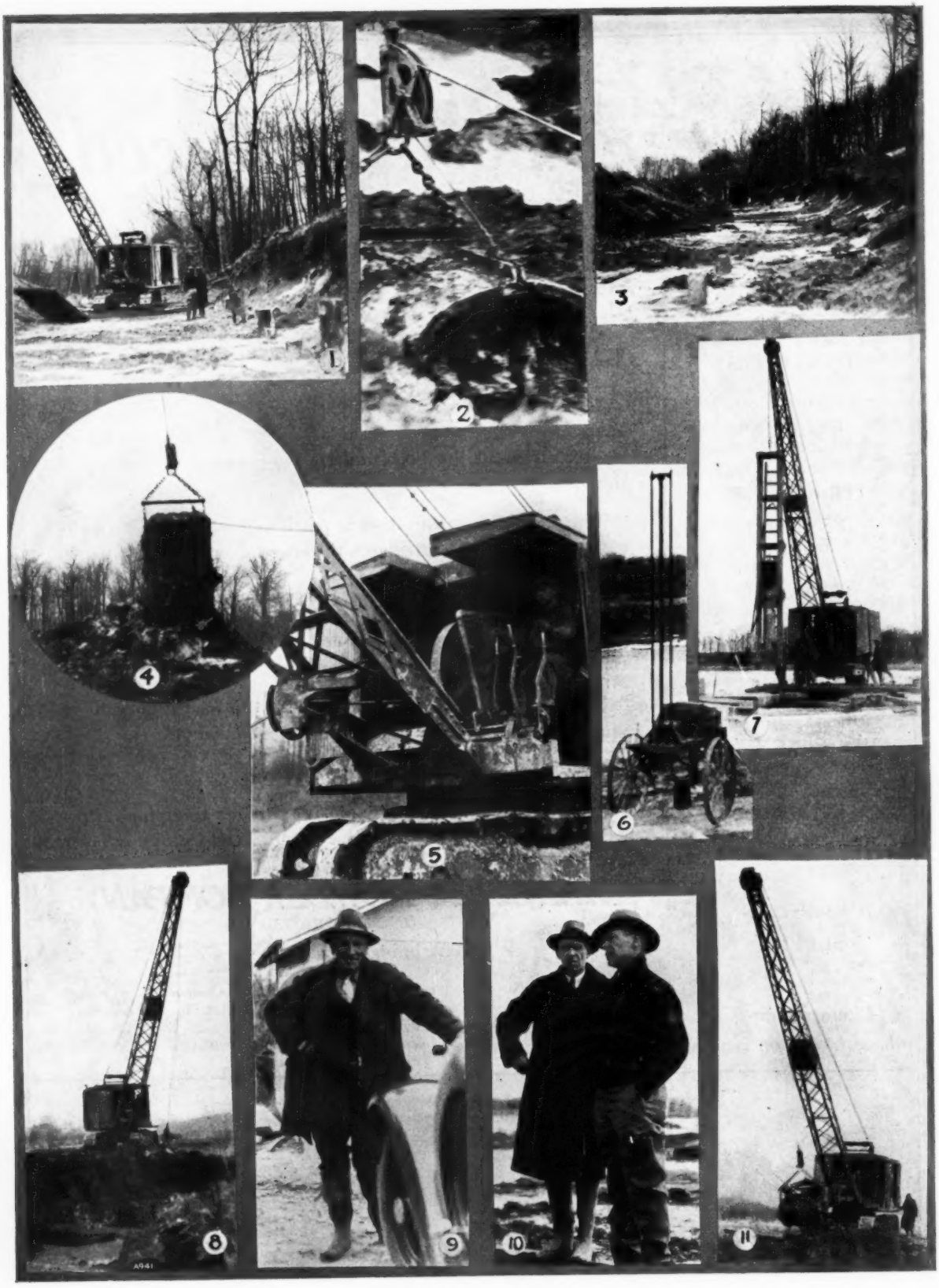

The Mentor Harbor Job in Pictures

The EXCAVATING ENGINEER

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The R. C. Huffman Construction Company Transform Lake Erie Marsh Into 5½ Million Dollars Worth of Real Estate

Convert Five Hundred Acres of Waste Land into Home-Sites for Ohio Millionaires.

TWENTY-FIVE miles east of Cleveland on the Lake Shore Boulevard, the Grand River, in centuries gone by, dug a wide, shallow bay inside the sand bars at its mouth. About sixty years ago men decided that the river could be used to advantage to form a harbor at Fairport, moved it, and left Mentor Marsh, five hundred acres of muck and swamp grass.

Today the R. C. Huffman Construction Company — of Cleveland, Ohio; Elyria, Ohio; Toronto, Ontario; Hamilton, Ontario; West Palm Beach, Florida; and Coral Gables, Florida — working for the Mentor Harbor Development Company, is converting Mentor Marsh into Mentor Harbor — a real estate development de luxe, where beautiful boulevards, parks, lagoons and yacht clubs will attract Clevelanders, as well as wealthy men from nearby cities, to buy and build on the large, built-up lots, each with its private waterfront and boulevard entrance.

Handling of Job Shows Many Features of Interest

As we have learned to expect of Huffman jobs, the Mentor Harbor contract shows many features of unusual interest, with highest efficiency in planning, organizing and operating the job. Contract is placed on the basis of a 3-year program, and involves 1,200,000 cubic yards of excavation, with piers, piling and retaining walls. The work was started by the Huffman organization a year ago this spring. The operation consists of opening up into the lake a clean channel, protected by breakwaters, digging an entrance harbor with long lagoons extending like curving fingers back into the marsh itself. The rich, black alluvial deposits dug from these channels is placed on the low ground at the sides to build up the lots to a suitable elevation above the water level. Holding the soil in place, and preventing the silt from filling up the channels, a retaining wall of concrete slabs set in sockets against concrete piles, and tied by iron rods to a secondary row of wood piles, encloses all land areas.

The Mentor Harbor Job in Pictures

1. E. W. Waller runs his Gas + Air down the shore to dig trenches for the fresh water conduit under the island. 2. There is no trouble filling the Diesel + Air drag bucket in the blue clay and muck. 3. In some places it was necessary for the draglines to excavate to dock level before driving piles. 4. Piling up the dike for the dredge settling basin, the Diesel + Air bucket cleanses itself readily. 5. R. A. Davis, crack operator, at the levers of the Diesel + Air. 6. A Budd post hole digger was on the job, and used where hard material was encountered, to open up a hole for starting concrete piles. 7. The Gas + Air machines made ideal piledrivers for this job, because of their ability to furnish their own air. 8. Dragline operation was the only logical method for handling construction of the dikes. 9. W. J. Rae, Superintendent of the Mentor Harbor job. 10. Carl Rowan, in charge of the job office for R. C. Huffman Construction Company, with J. Nokes, Vice-President of the F. A. Pease Engineering Company, making a tour of inspection over the job. 11. Another view of the Bucyrus-Erie Diesel + Air.

Mechanization Cuts Operating Crew to Minimum

The work is being done in several stages, and, as largely as possible, by mechanical means, requiring the least number of laborers. The operation starts with draglines casting up a dike of dirt around the land areas to form the settling basin for the discharge of the hydraulic dredge which handles the excavation of the canals. When the

operation was started these draglines were operated on the outside or water side. It was found, however, that this method cut up the berm along the waterfront, so as to make difficult the later operations of driving piles and setting slabs, which

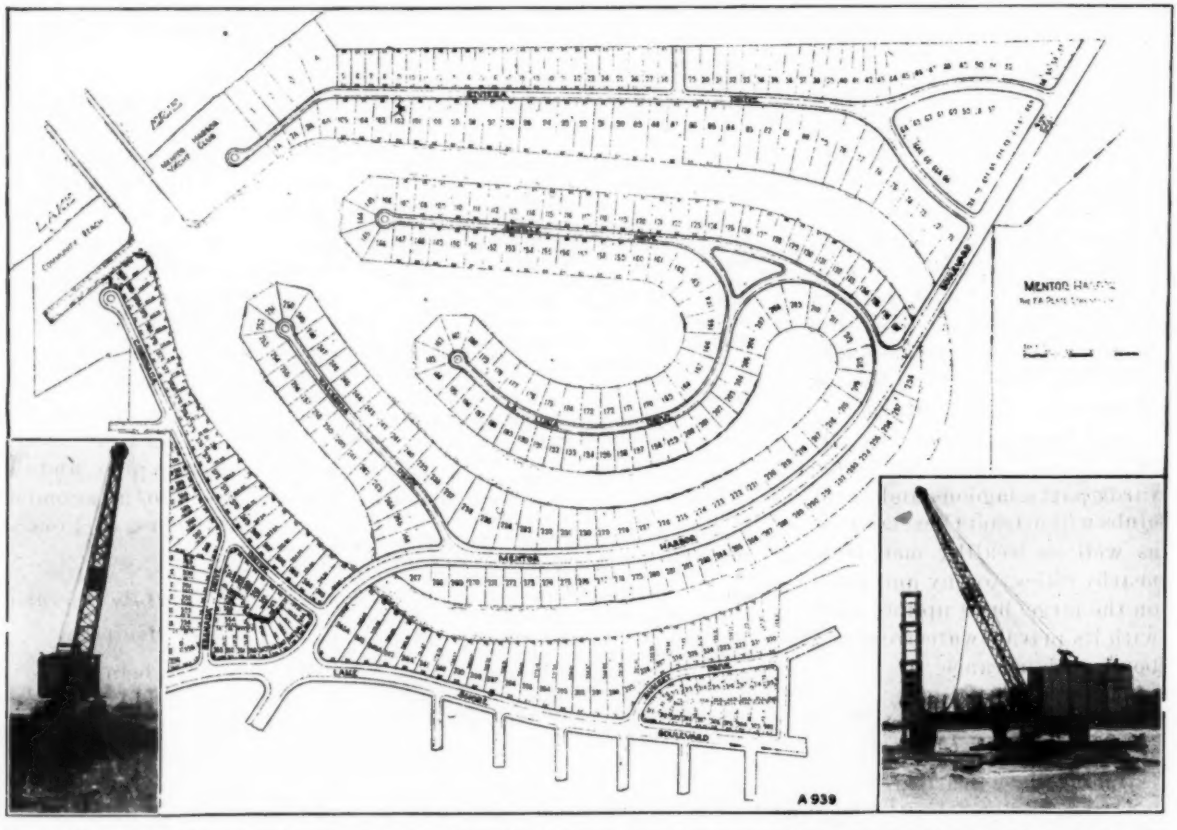
Camp Site at Mentor Harbor.

required movement of caterpillar-mounted excavators over the same area. The method of handling this operation was, therefore, changed so that the draglines now operate from inside the spoiling ground, thus leaving a good level runway on the outside of the dirt retaining wall for the later operations.

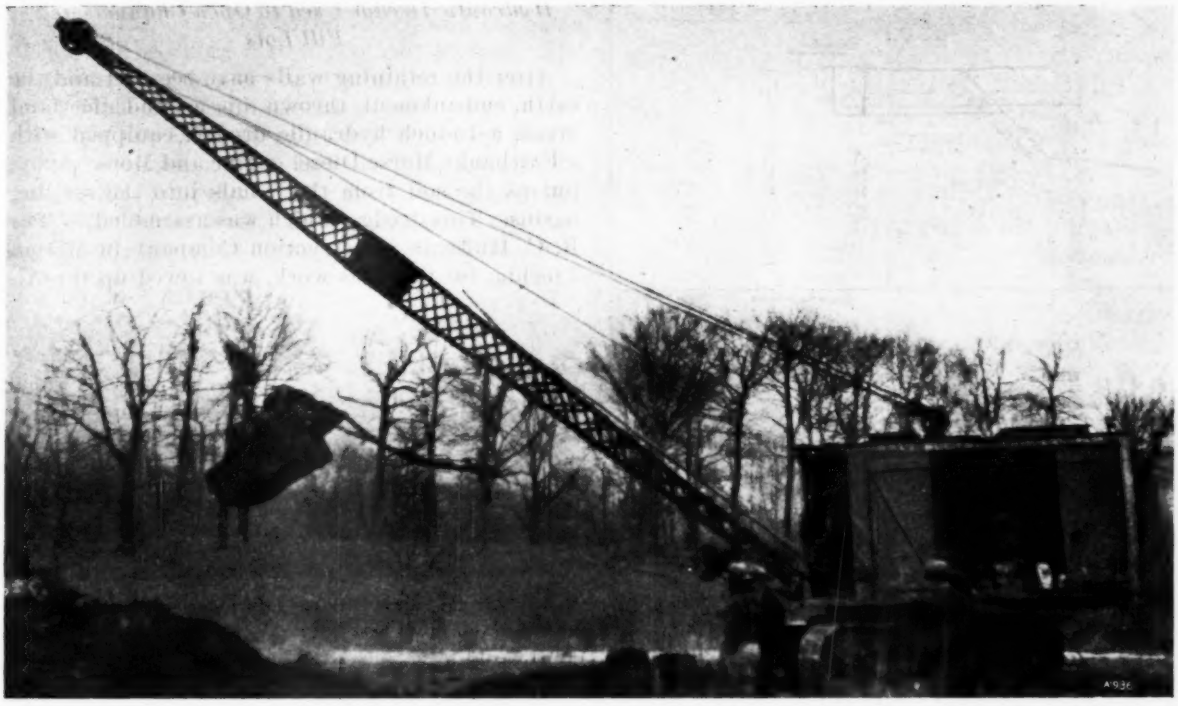
Bucyrus-Erie Diesel-Plus-Air Shows Great Efficiency on This Work

At the time of our visit the Bucyrus-Erie Diesel-Air, sister machine to the famous Gas-Plus-Air, was engaged in this dragline work, and handling it in a manner which made the entire Huffman organization most enthusiastic in regard to this latest development in the Bucyrus-Erie line of excavators. The digging was comparatively easy, consisting largely of black, alluvial dirt with hard, blue clay in the bottom of the trench. The going along the surface of the marsh is very soft, and it is necessary to handle the machines on wide mats in order to keep them from bogging down; even so, some places are extremely soft, and the pit man on the Diesel-Air greeted our cameraman with: "You should have been here a couple of days ago so you could have snapped her climbing out of a bad hole we dropped into; she certainly can pull herself out of anything."

Smooth and positive control was evident in the accuracy with which the operator placed the



Plan of Mentor Harbor, showing arrangement of roads, boulevards and lagoons. A creek channel enters the outer lagoon at the right, and fresh water is carried by conduit under the island into the other lagoons so as to keep the water always fresh. Insert shows the Bucyrus-Erie Diesel + Air dragline on the left and the Bucyrus-Erie Gas + Air pile driver at the right.



The entire Huffman organization at Mentor were most enthusiastic about the new Bucyrus-Erie Diesel-Air.

bucket, and the powerful snappy action was very noticeable. Operator R. A. Davis was most enthusiastic about the machine, commenting especially upon the ease of operation — "Like it even better than the Gas-Plus-Air," was his comment. An obvious advantage of the Diesel-Air is the great fuel economy possible. Earl Rowan, who has charge of the office end on the job, tells us that from twenty to twenty-five gallons of fuel oil, costing 8¼ cents per gallon, keep the machine operating the full ten-hour shift. The average cost of fuel oil, lubricating oil and grease runs from $2.50 to $2.75 per shift. These costs apply to the work of casting with the dragline where the machine is in continuous operation, there being no occasion for any delays.

Air from Excavators Supplies All Requirements for Driving Piles, Sheet Piling, Etc.

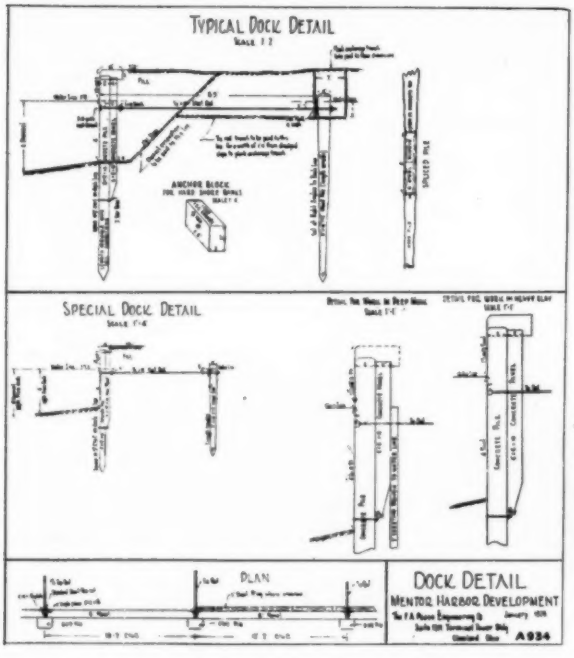
Behind the Diesel-Air comes one of the Bucyrus-Erie Gas-Plus-Air machines, driving several rows of piling required to support the retaining wall. In the places where the muck runs quite deep a wood pile is driven first on the outside wall, then a concrete pile with a socket on the end is set on top of this and driven, while wood piles are set, in all cases, in a secondary row behind the concrete piles with an iron rod tying them together. In all there are approximately 2800 of the concrete piles, 3,000 of the wooden tie piles, and 500 wooden extension piles used beneath concrete piling. All these piles are being driven by the two Bucyrus-Erie Gas-Plus-Air machines, which handle the work in a very satisfactory manner. All compressed air used on the job is furnished by the excavating machines (Gas-Plus-Air and Diesel-Plus-Air). This has brought about a considerable saving in the cost of driving the piling, sheet piling, slabs, etc.

But to get back to the method of operation. Behind this Gas-Plus-Air follows a Northwest, equipped with clamshell and hook. This machine opens up a trench between the primary row of piles and the secondary row of piles, to permit setting of the iron rod which connects the two. This machine also opens up a trench between the concrete piles and sets in place the concrete panel. These panels are concrete slabs 6 to 8 feet deep, which set into iron sockets provided for them on the inside of the concrete piles. Pile and panel are covered when the job is finished with a concrete coping.

The concrete piles used are from 12 to 20 feet long, and where the muck is deep the wood pile extensions make a combined pile of 50 feet. In all, there is approximately 5½ miles of this retaining wall.

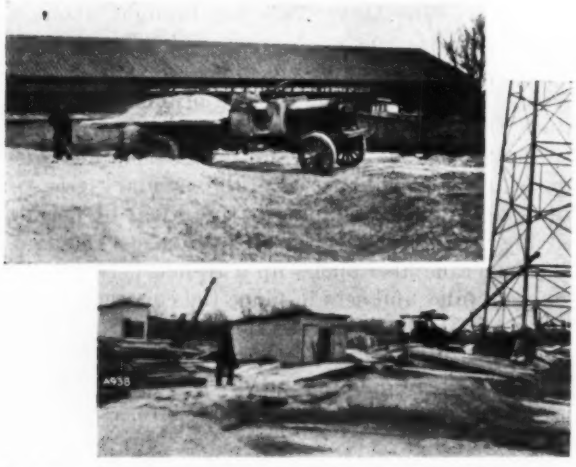
Second Gas-Plus-Air Machine on Scow Driving Piles in Deeper Water

Out in the deeper water of the present channel we found one of the Bucyrus-Erie Gas-Plus-Air



machines on a scow where it was driving piling and placing the slabs. 9B2 Hammers are used in the driving of piles, while No. 7's are used on the sheet piling.

When the Diesel-Plus-Air has completed its work as a dragline, it is planned to use it driving sheet piling and placing slabs. The machine has also been used for driving piling.



In the concrete casting yard at Fairport we found the crew loading crushed rock on to Indiana trucks to be used in surfacing temporary roads in the vicinity of the Mentor camp. Just behind the truck in the upper picture can be seen the Diesel dredge "Salvager." The lower picture shows the casting yard and cranes, a P. & H. at the right and a Buckeye at the left.

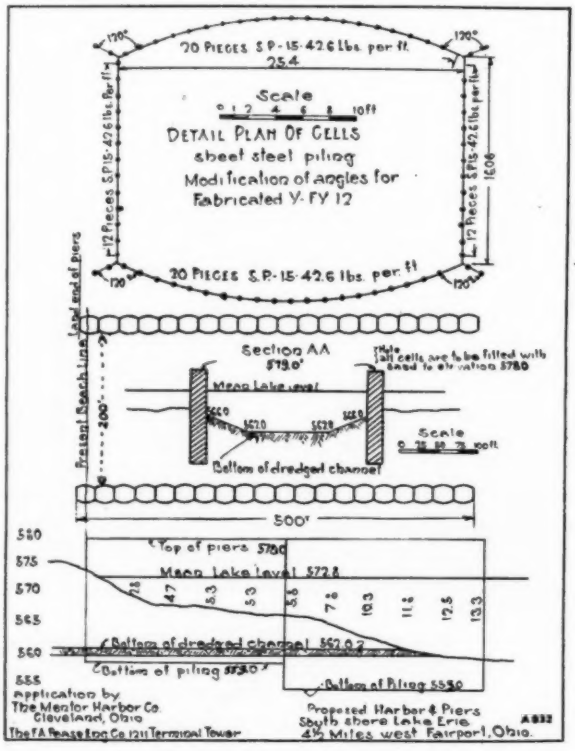
There was a P. & H. gas machine on the job, but this has not been working during the winter. It is used for unloading piles and panels and for miscellaneous work around the job.

Hydraulic Dredge Used to Open Channels and Fill Lots

After the retaining walls have been set and the earth embankment thrown up around the land areas, a 10-inch hydraulic dredge, equipped with a Fairbanks-Morse Diesel engine and Morse pump, pumps the soil from the canals into the settling basins. This dredge, which was assembled by The R. C. Huffman Construction Company in Miami, Florida, for previous work, was towed up the Atlantic Coast to New York and brought through the Erie Canal in May 1928. R. C. Huffman's 57-foot Diesel tug handled the tow, and the entire trip required only six weeks, including time during which the dredge in tow laid in during bad weather.

Gas + Air on barge, driving piles along channel way just inside the harbor entrance.

The dredge has not been working during the winter, but it is expected to start about March 15.



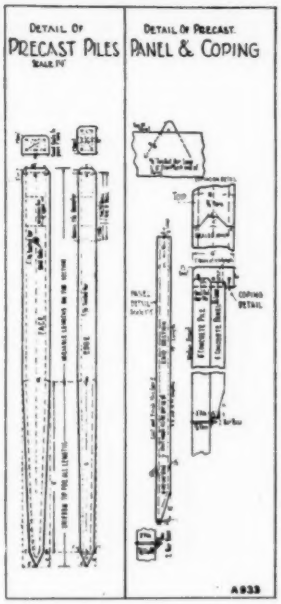
The entrance to the harbor basin and the basin itself will be dredged to a depth of 10 feet. The canals are dug to a depth of 8 feet, with 20 feet of the bottom nearest the docks sloped upward. The channels are 150 feet wide and wider, up to 325 feet at the widest. The lots are built up with 50 feet width along the dock at an elevation of 3 feet above the water level. Here the land is terraced up to an elevation of 11 feet above water level.

Slabs and Piles Cast at Fairport Harbor and Hauled by Scow

The R. C. Huffman Construction Company build their own concrete slabs and piling for the job, preparing this material at Fairport Harbor because of the convenience offered by this location in securing materials for the concrete. In a yard on the waterfront at Fairport they have built forms for both piling and panels and here these are poured, the concrete being prepared by a one-half-yard Rex Mixer. A P. & H. crane is used at the yard for handling the aggregate, and also the concrete slabs and piles after they are completed.

Indiana trucks take the finished material to the Mentor Harbor development as required.

In charge of the Mentor Harbor development is S. C. McKenzie, General Superintendent for R. C. Huffman Construction Company, and in charge of all northern operations. W. J. Rae is superintendent at Mentor Marsh, with E. Rowan in charge of the office. The development is planned and supervised by The F. A. Pease Engineering Company and J. Nokes, Vice-President for this company, is chief engineer for this project. S. Skowronski is resident engineer for the Pease Engineering Company. General foreman on the job for the R. C. Huffman Construction Company is H. Smiley. E. W. Waller is handling the levers of one Gas-Plus-Air, while A. McDowal is operating the other one. R. A. Davis handles the Diesel-Plus-Air, H. Webber the Northwest, and A. Hauser the two P. & H. machines, alternating from one to the other as may be required. Capt. F. Rose has charge of the dredging operations, while Capt. H. Kirkwood takes charge on the night shift.



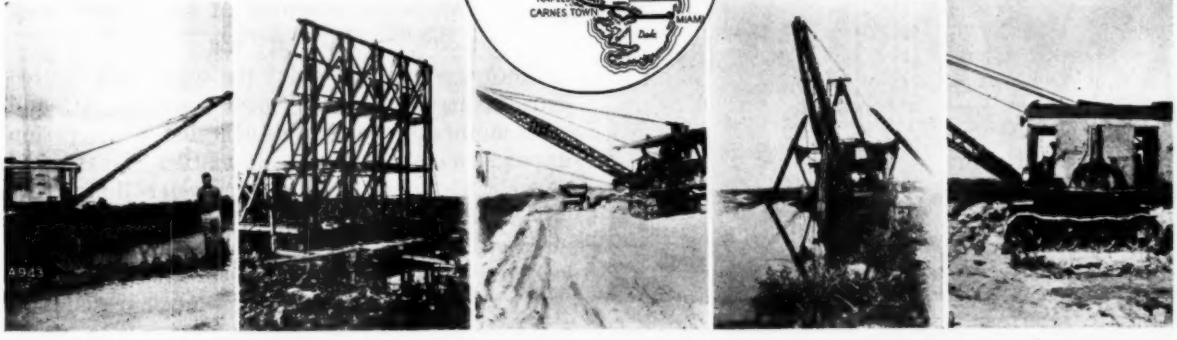
R. C. Huffman of Cleveland is President and General Manager of The R. C. Huffman Construction Company, with W. H. Stark of Elyria, Ohio, as Secretary and Treasurer. A. F. Eberwine is in charge of the main Cleveland office.

Among other jobs being handled at present and to be started in the near future by The R. C. Huffman Construction Company are the Grand Trunk Railroad Bridge across Black River at Port Huron, Michigan; 64 miles of channel dredging in the Illinois River between Grafton and La Grange Locks; a harbor dredging contract for the Atlantic Coast Line Railroad at Tampa, Florida; and building railroad grade and bridges for the Canadian National Railroad at Hamilton, Ont.

Work on Tamiama Trail Attracted Nationwide Interest

One of the best-known jobs which this organization handled was their part in the building of the Tamiama

(Continued on page 176.)



With R. C. Huffman Construction Company on the Building of Tamiama Trail.

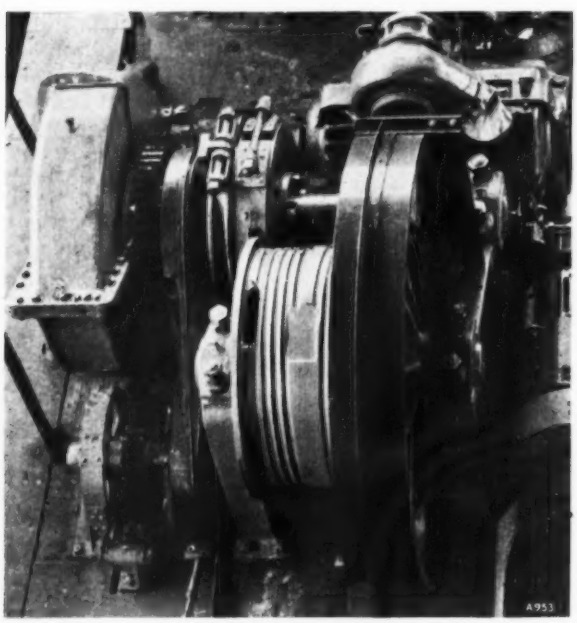
1. Bucyrus-Erie one-yard dragline casting up material for the road grade from irrigation canal alongside the road. 2. Drill barge carrying five Ingersoll-Rand hammers, three 10 x 8 compressors and one drill sharpener. 3. Bucyrus-Erie Gas + Air dragline loading trucks. 4. 2-yard dipper dredge used to remove muck from the bottom of the canal so as to uncover an adequate supply of rock for ballasting the road. 5. Bucyrus-Erie 50-B dragline which handled the bulk of the rock digging.

The Most Remarkable Electrical Development for Shovels

A Discussion of Motor Lowering vs. Brake Lowering

IT has always been the practice on steam shovels to lower the dipper by disengaging the clutch between the engine and drum, and allow the dipper to fall and catch it at the bottom on the foot-operated brake. On large steam stripping shovels, the practice is varied by lowering the dipper part way by backing the engine and then throwing the clutch out and letting it fall the remaining distance. To perform this operation smoothly requires considerable lever manipulation and skill on the part of the operator. The dipper cannot be lowered fast on the engine, because racing an engine results in wear and tear on the reciprocating parts and high maintenance.

Naturally, the first electric shovels built lowered the dipper after the fashion of the steam shovel. Later some of the larger stripping electric shovels lowered part way on the motors, and then threw the clutch out for gravity lowering for the final distance. The first shovels which made the complete lowering cycle with the motors connected to the drum continuously were put in operation in 1917 and were driven by AC motors. Then came the Ward-Leonard control, first with series-wound motors, and motor lowering was accomplished only somewhat satisfactorily. Finally with Ward-Leonard control, on shovels, came the separately excited motor, and the first 100 per cent satisfactory means of lowering the dipper without disengaging the clutch and using the foot brake.



The main machinery of a 4-yard quarry and mining shovel with Ward-Leonard control and separately excited shunt motors. Note absence of air compressor, and the two heavy housings necessary in the past for clutch and lowering brake. With this type of machine the energy of the falling dipper is returned to the power line to reduce the cost of power instead of burning out brake and clutch bands.

Motor Lowering Now Used on as Small as Two-Yard Shovels

Motor lowering was used first on the larger shovels but has been so successful with the separately excited motor that it is now used on even two-yard shovels making three or more cycles per minute. The separately excited motor gives all the lowering features that are desired; first, a quick "kick-off," that is, acceleration of the moving parts to get the dipper started down quickly; second, high speed, as the field of the motor is weakened considerably and the motor speeded up to its safe mechanical limit; and third, a smooth and quick stop at the bottom to be ready for the next digging stroke as the field of the separately excited motor is strengthened and the generator voltage reduced, increasing regeneration and giving a heavy stopping torque. Since the changes in current are the result of magnetic changes in the motor and generator fields, they are gradual and result in good commutation on the motor and generator, and fast, ideal lowering. The AC slip ring induction motor has a quick "kick-off," but its maximum speed is limited by the safe voltage obtained in the rotor when plugging at the bottom. The DC series motor has no "kick-off," because it holds back immediately on starting, and it requires special field coils in the generator to obtain high speed, and what is more objectionable it requires resistors and contactors to prevent excessive currents when stopping at the bottom and, even then, the stopping is jerky.

Another advantage which the separately excited Ward-Leonard motor has over both the AC and series motors is that there is complete regeneration of power right down to standstill. By this is meant, with the AC motor the regeneration occurs only while the motor is running above synchronous speed, and the deceleration from synchronous speed to standstill is in the form of what is commonly called plugging or running on resistance, in which case there is no regeneration. In lowering with the series motor and Ward-Leonard control, the plugging resistance absorbs energy, preventing full regeneration. With the separately excited motor, all the energy of the falling dipper

and the rotating parts is regained and put back into the power line.

Record of an Eight-Yard Shovel Loading Cars

Figure 1 shows the HP input to the hoist motion of an AC shovel, one of the first to use com-

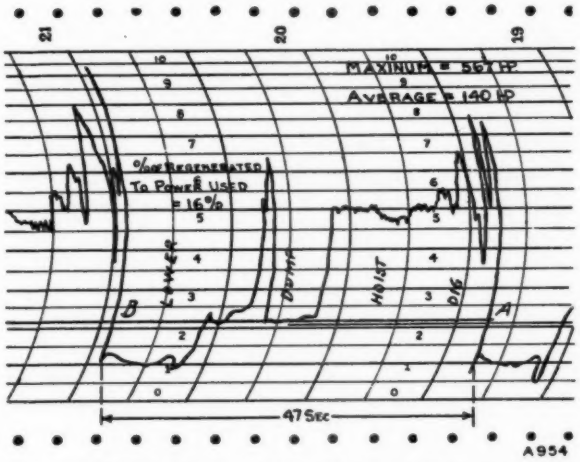


Fig. 1 — KW Input to Hoist Motion of Pioneer "Motor Lowering" Shovel, Driven by A.C. Induction Motors.

plete motor lowering of the dipper. The curve reads from right to left and the positive power or input begins for a typical cycle at "A" where the shovel starts digging. The power varies on account of the variation of the material in the bank, then, after the dipper leaves the bank, the power demand becomes steadier. When the dipper is high enough the power is shut off and the hoist motion is idle for a few seconds while the dipper is being dumped, then the short peak shown, covers the hoisting of the empty dipper so the open door will clear the side of the car. The power is shut off and the motor is reversed so it will lower and the power input becomes negative, the curve going below the line. The motor is then running above synchronous speed and pumping back power to the system until point "B" is reached, when the motor is plugged and stopped to begin another digging stroke. The amount of negative power is measured by the area below the zero line, and is about 16 per cent of the positive power. This record covers an 8-yard shovel loading cars.

How Motor Lowering Works Out on 12-Yard Shovel

Figure 2 shows motor lowering on the modern 12-yard shovel equipped with separately excited motors and Ward-Leonard control. The curve represents the direct current input to one of two main hoisting motors driving the hoist drum. The machine begins digging at point "A," and, of course, draws power from the line while pulling through the bank, the power running up over 300 kilowatts. After leaving the bank, the speed and power are reduced to wait for the swing motion to get around to the dump. At this point, the operator hoists a little higher, which accounts for the second peak, and after dumping the controller handle is reversed and the motors begin to lower, the power becoming negative, reaching a value of about 175 kilowatts. The motors are now up to their maximum speed, and the regenerated power reduces as the dipper approaches the bottom. This

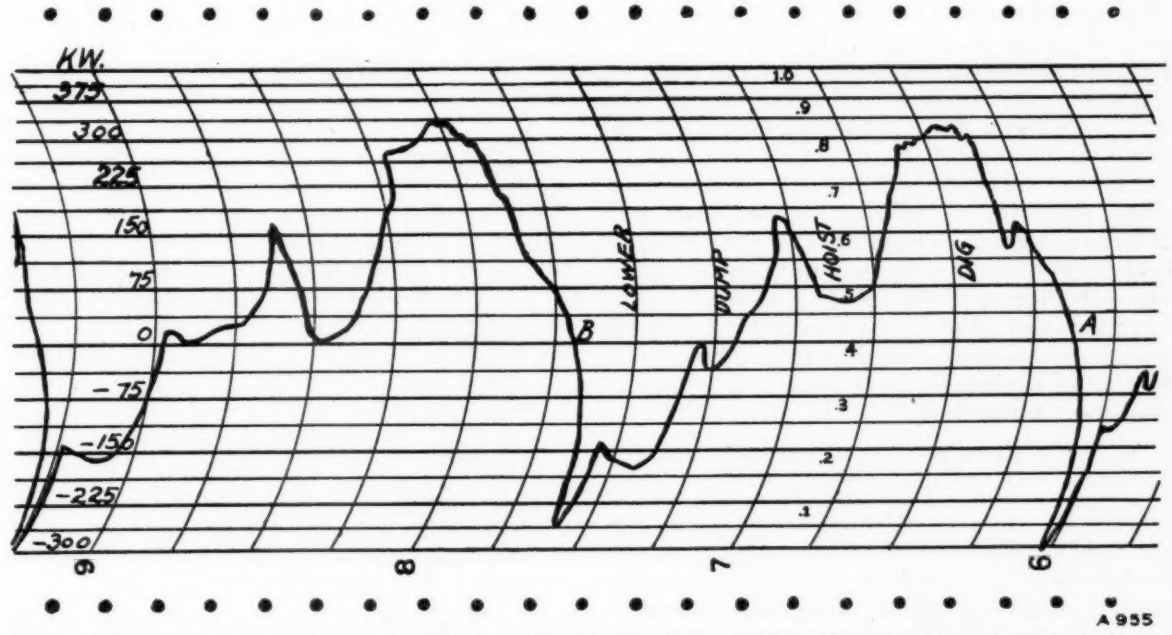


Fig. 2 — KW. D.C. Input to Hoist on a Typical Large Shovel with the Latest Ward-Leonard "Motor Lowering" Control.

power would become zero when the dipper reaches a point below the shipper shaft and the handle is vertical; but, before this point is reached, the operator must reverse his controller and begin stopping. In doing this, the power is increased to about 260 kilowatts by regaining the energy of the rotating parts. At point "B" another cycle begins. Here again, the power returned to the power line is represented by the area below the zero line.

Simplicity of Motor Lowering Unit Increases Reliability

Figure 3 shows the hoisting machinery of a typical modern heavy-duty mining and quarry shovel, equipped with the latest type of motor lowering control. The absence of brakes and clutches on the drum shaft and the resulting simplicity of the unit is noticeable. The drum gear meshes with an intermediate shaft pinion driven through a simple slipping clutch, which irons off excessive mechanical peak loads. These sometimes result from the dipper striking an unyielding obstruction and stopping quickly, in which case the flywheel effect of the motor would build up considerable overstress if it were not for this slipping clutch. On this same intermediate shaft is a simple brake used only to hold the dipper in the air while the hoist motor is being used to propel the machine forward.

On the same shaft is a double-acting jaw clutch, when thrown in one direction this connects motor to hoist drum, and when thrown in the other direction, it connects the motor to the propelling machinery. The intermediate shaft is driven through a herringbone gear meshing with a herringbone pinion on a stub shaft, which is flexibly coupled to the hoisting motor. The herringbone gears are completely encased and run in oil. This machinery unit is to be contrasted with the old-style machines which had two heavy housings and bands on the drum shaft, one for a clutch and one for a lowering brake. The clutch required some sort of operating air cylinder, air compressor with governor, piping, reservoir, etc. Furthermore, both the clutch and brake had to be operated during each digging cycle. Modern motor lowering has eliminated all of these parts, including the air compressor on many sizes of shovels. This simplification of equipment leads to greater reliability and lower maintenance.

Operator Given Better Control with Motor Lowering

Motor lowering gives better control of the dipper and it is easier for the operator. In the first place, less skill is required, because the complete hoisting and lowering operation is performed by one lever, the hoist controller handle. There is no foot brake to operate, and there is no timing of disengagement and engagement of clutch and operation of brake. An experienced steam shovel operator, after he had been on his first electric machine — one with motor lowering — long enough to lose his prejudice, was asked what he liked about the electric machine. He answered that he could clean up the pit better with the electric because he could handle the dipper with greater accuracy by using the hoisting and thrusting motors than he could with the steam machine where he had to use the hoist brake.

Motor lowering results in a smoother operation because the acceleration and deceleration is made gradual by the flywheel effect of the motor armature, whereas with brake lowering the stopping at the bottom is rapid and jerky, and results, sometimes, in a whipping action of the hoist rope which shortens rope life. Motor lowering results in less maintenance, not only on account of smoother action but on account of eliminating the operating brake and clutch. With the old-fashioned brake lowering, the energy of the falling dipper was spent in wearing out brake and clutch bands,

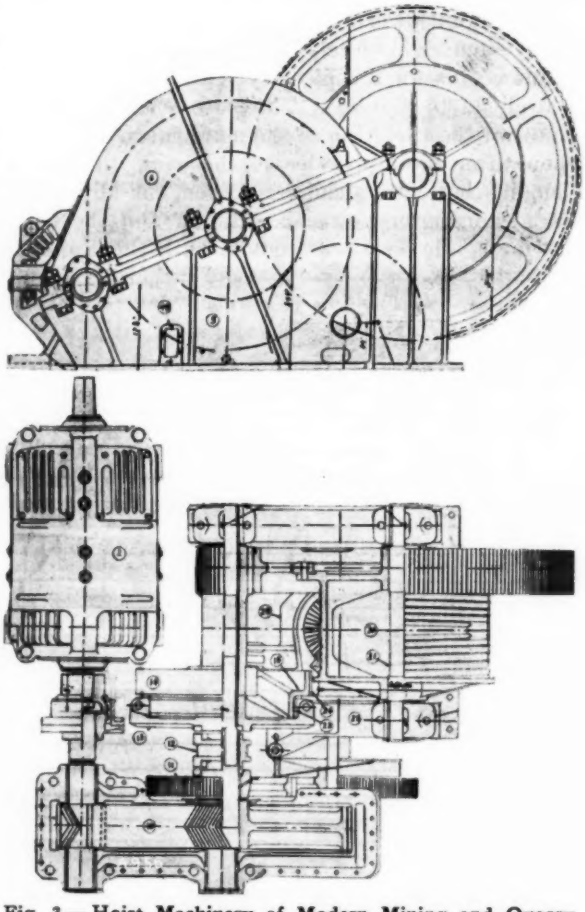


Fig. 3 — Hoist Machinery of Modern Mining and Quarry Type Shovel Equipment with "Motor Lowering" Control.

whereas now this energy is returned to the power line and reduces the power bills. Referring to Figure 2, the amount of negative power regained by regeneration, is about *33 per cent of the power used for the hoist motion.* Hence, while power saving is only an incidental advantage of motor lowering, it can be seen that with the separately excited motor control it is a very considerable item. This is also borne out by the kilowatt hours per cubic yard which modern shovels with motor lowering require, as compared with earlier designs using brake lowering. The brake lowering shovel uses 20 to 25 per cent more power.

Motor Lowering Cycle Just as Fast or Faster Than Brake Lowering Cycle

Motor lowering even on the smaller sizes of shovels which replace the old-fashioned railroad shovels, is entirely comparable to brake lowering as far as speed is concerned, and in some operations, such as quarry work, is faster than brake lowering. This was a hard thing to understand until it was carefully studied. It was found that with brake lowering an operator is inclined to pull his dipper handle in almost completely before he begins to lower the dipper, for fear it will not clear the bottom or some large rock which might be in the pit in front of the machine. With brake lowering, the dipper comes down so quickly that the operator must be safe and clear with his handle before he begins to lower. This means, then, that he does not overlap the racking in and lowering. He pulls his handle in while swinging back from the dump and then after the handle is in, he lowers the dipper. In other words, he will swing 30 or 40 degrees away from the car before beginning to lower.

With motor lowering, he will begin lowering immediately after dumping the dipper and leaving the car, swinging and racking in at the same time, thus securing overlapping of the various motions. The net result is a faster cycle, although the actual descent of the dipper with motor lowering might be a little slower. The operator can spot the dipper more accurately with motor lowering than with brake lowering, because it is difficult to spot when the dipper is falling too fast. With motor lowering it is under control at all points of the descent.

The motor, with the separately excited motors and Ward-Leonard control, actually helps the dipper get started at the beginning of the lowering operation. In other words, electric power drives the motor down until it reaches a certain maximum speed, depending on the position of the controller handle, and when it reaches this maximum speed the motor then acts as a generator and holds back. This is a characteristic of this type of control, and the result is that the motor actually accelerates itself, the intermediate shaft and the drum and pays off rope to the dipper.

When cleaning up at the bottom, and the dipper is not hoisted very high, in lowering, the motor actually accelerates the drum and pays off rope a little faster than the dipper will take it. This can be observed at any time during cleaning up, by watching the slack in the jaw clutches being taken up in the reverse direction when the motor is accelerating the drum downward. Instead of the motor being a drag under this condition, it actually unwinds the rope, relieving the descending dipper of the burden of accelerating and overhauling the drum.

Another desirable characteristic of the separately excited motor, which is very beneficial, is that of continuing to run at high speed even though the dipper ceases to pull on the rope and overhaul the drum and motor. What is meant by this is that after the dipper handle lowers to a vertical position, it no longer will pull on the rope by gravity. It will, however, swing past the vertical-like pendulum due to its momentum. The hoist motor will continue to run practically as fast even after the dipper quits pulling on the rope. With this characteristic, the dipper is free to swing back behind rocks which roll in close. In other words, the operator has every opportunity to clean up the pit as far as swinging back behind boulders is concerned, and in addition, he has better control through the motor than he would have through a brake, although careless operation will result in the dipper striking the boom or caterpillar treads just with the brake lowering machine.

A good idea of the quickness of acceleration and deceleration of the hoist motion in lowering, may be obtained from Fig. 4. This is a tachometer record of the hoist motor speed of a mining type shovel working through its regular cycle. The curve reads from left to right. The meter needle travels the same direction, regardless of whether the motor is running forward or backward. During digging and hoisting, the motor reaches 600 R.P.M. During lowering it reaches 1200 R.P.M. and starts and stops very rapidly. The low percentage of the complete cycle spent in motor lowering is clearly shown on this chart.

Kilowatt Record at Five Cycles Per Minute

To illustrate the speed and quick response a shovel operator has at his command with a separately excited Ward-Leonard motor on the hoist, note Figure 5. It is a kilowatt record of a quarry shovel hoisting and lowering the empty dipper at an average rate of five cycles per minute, much faster than required for normal operation. The curve is interesting to consider in detail. At point

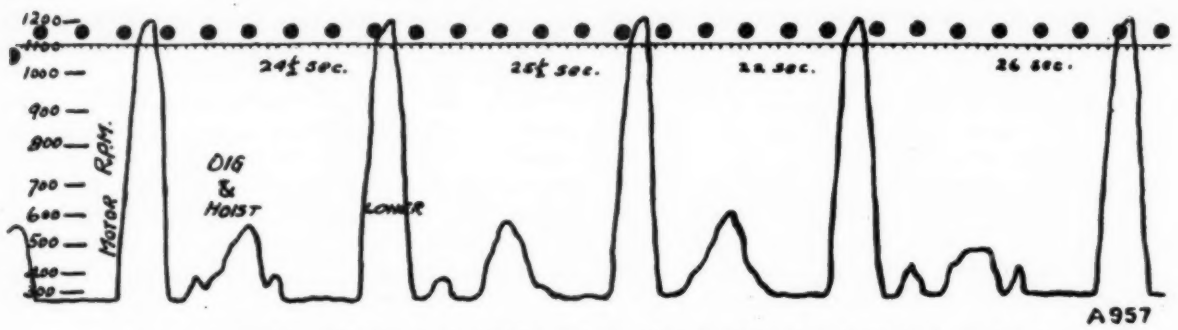


Fig. 4 — Motor Speed During Normal Digging Cycles Showing High-Speed "Motor-Lowering."

"A" the dipper is lowering fast, and the operator throws his controller from full speed lower to full speed hoist. This checks the motion, and the regenerated or negative power increases materially until the motor and dipper come to rest. Power is then drawn from the line and the dipper is hoisted. At point "B" the motor is hoisting, and the controller handle is thrown from full speed hoist to full speed lower. Note here that the power immediately becomes negative, point "C," which means that the motor is braking and regenerating and helping gravity stop the dipper, even though it is traveling upward. The motor comes to rest at some point between "C" and "D." The power drawn from the line at "D" accelerates the motor at the beginning of lowering during the "kick-off"

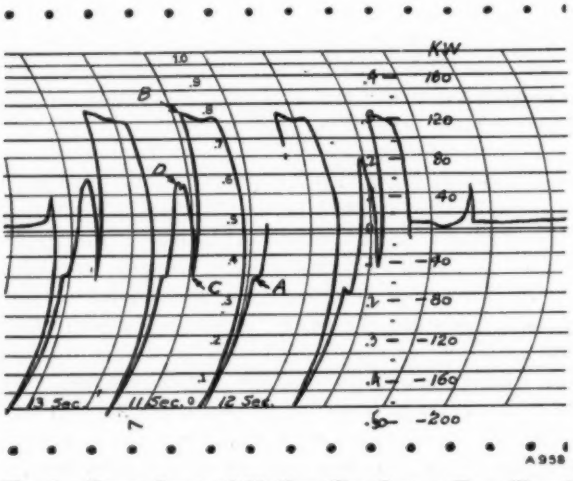


Fig. 5 — Power Input of Medium Size Quarry Type Shovel Raising and Lowering Empty Dipper from Top to Bottom.

period. The actual braking action at point "C" is greater than indicated by the chart, because the meter was some distance from the shovel and included AC line losses, motor generator and transformer losses and exciter load. This control is so quick and complete that it helps stop the dipper, even when going up. A series motor won't do this because it will not hold back unless it is reversed, and series motors with Ward-Leonard control are not reversed on shovel hoists except through knife switches and then only for propelling.

The separately excited motor with Ward-Leonard control offers many advantages over any previous scheme of control used for shovels. Among the advantages are the complete control of the motion, which the operator has regardless of whether the motor is holding back or driving forward, he can graduate his torque and speed in either case; it eliminates the necessity of all contractors and resistors in the armature circuits, and results in excellent commutation on both motor and generator, and it saves a considerable amount of power due to regeneration on all motions, but the most remarkable advantage in this type of control is "motor lowering" or the ability to lower the dipper without the use of a clutch and foot brake.

Good Melting and Pouring Ladle

A good bearing metal pouring and melting ladle can be nicely made in an emergency of an old Ford engine piston. Cut if off with a hacksaw a little below the second ring groove. Wrap and bend a piece of stiff heavy wire or small round iron around it in one of the grooves as shown, affording a safe and rigid handle. It will, of course, not last a lifetime, or stand any terrific heat, but in a pinch it makes a dandy, and will fill the bill for a long time. A good one to remember for some of those jobs where the machine is miles from a shop of any kind.

— *Frank W. Bentley, Jr.*

Earnest Worker

"Does your typist use the touch system?"

"Well, she certainly didn't buy that fur coat out of her wages." — *Judge.*

Poor Pa

Mother: "Now Willie, I want you to go in and get acquainted with the new nurse and kiss her nice."

Willie: "Yes! and get my face slapped, like papa did."

Winning the Clay at Bohnsack Brick Plant

New Plant at Chicago, Illinois, Model of Efficiency

Bucyrus-Erie 80-B electric shovel winning clay in the pit of the Bohnsack Brick Company.

IN building the new Bohnsack Brick Plant, which was placed in operation last summer, the wide experience of the builders was utilized to secure a plant properly equipped to manufacture the very best quality of brick at the lowest possible unit costs. An all electrical plant was determined on as best meeting these conditions.

The clay pit consists of forty-two and one-half acres of good quality blue clay. This deposit runs up to seventy feet deep, and will keep the present plant supplied for about thirty-five years. No overburden is present, the clay running clear to the surface, and this permits a very economical production.

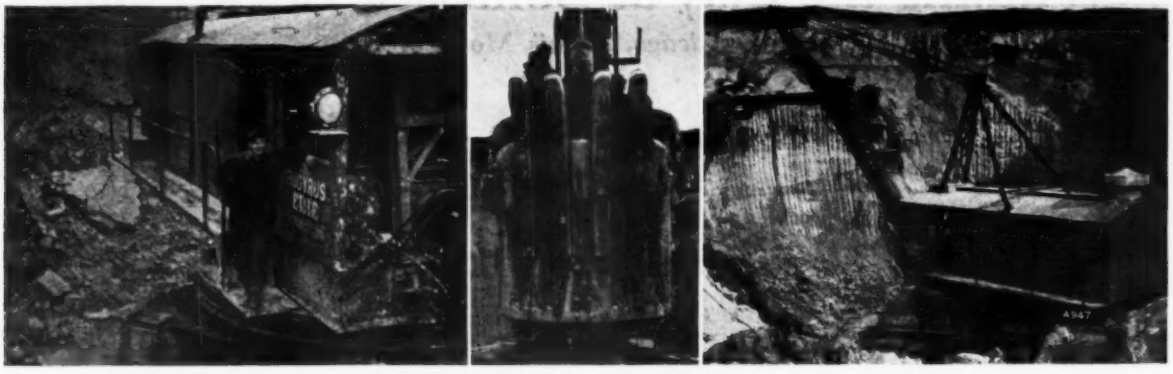
Bucyrus-Erie 80-B Digs Clay

For winning the clay a Bucyrus-Erie 80-B, 2-yard, electric shovel is used. The wide reach of this machine is of particular advantage on this operation, as it can dig a bank fifty-five feet high, and open a cut one hundred and seven feet wide. The machine loads into Western 4-yard dump cars which carry from 4½ to 5 yards of clay. An eight-hour shift is worked, and from 20 to 23 of these cars are loaded in an hour. This is only about half of the capacity of the shovel, but it supplies the needs of the plant.

Wm. V. Carpenter.

At the time of our visit the machine was laying aside a considerable portion of the bank on account of frost, as about four feet next to the surface was frozen solid. The 80-B digs this frozen material without blasting, and sets the large frost chunks behind the shovel where the clay will be picked up and used during the summer.

Chief Engineer Wm. V. Carpenter, who is in charge of the pit, was most enthusiastic about their electric shovel. "I can't say too much for the shovel," he remarked, "she's a peach." Mr. Carpenter commented especially on the advantage of the electric operation, which permits them to throw a switch and turn off the expense at the end of the shift. The long reach considerably reduces the cost of track laying, and permits obtaining a very good mixture from the high face of the clay bank, and also permits working well away from the



Bert Nydam, shovel operator, 2 yards of good brick clay, and the 2-yard electric that Bert pilots.

face, so that there is no occasion for any delays due to slides from the bank.

Pump Attached to Underframe of Shovel for Dewatering

A Chicago Pump Company 2½-inch centrifugal pump of open propeller type is mounted under the shovel on the base together with its driving motor, a 10 h. p. Crocker Wheeler. This arrangement is a most convenient one, and takes care of dewatering the shovel pit without the inconvenience of moving the pump around where it is required. The open propeller type pump has also been found to work out most successfully, because there is no delay for removing solid material, which may be taken up into the pump.

Note the teeth marks where the dipper has cut through the firm blue clay, and also the frost strata at the top above the teeth marks. This is undermined and then broken off in large chunks.

An emergency four-inch dewatering pump, also manufactured by the Chicago Pump Company, is mounted in a portable house which can be handled by the shovel as required.

Cableway Hauls Clay into Plant

At present the cars are switched about in the pit by horses. As soon as the size of the pit makes it practical, a Baldwin steam locomotive will be used to handle the switching, and later on it is planned to replace this with a gasoline locomotive.

The loads are switched to the foot of a cableway where they are hauled up to the plant over a 12 per cent grade by a drum hoist driven by an 80 h. p. Crocker Wheeler motor. Four cars are in use at the present time, but two additional cars are on hand and will probably be put to work in a short time. At the top of the incline the hoist operator dumps the cars with the aid of a mechanical car dumper into a 15-foot granulator placed at right angles to the clay car track. A water pipe is located over the granulator to permit the addition

The dewatering pump at right is carried underneath shovel and handles ordinary pumping.

That on the left is used in emergency and is equipped for suspending it from the dipper of the shovel.

of water to the clay as needed. Coal dust is added by hand as the clay goes into the granulator, and as each car is dumped a shovel full or so of dust is sprinkled over the bottom of the car to prevent the clay from sticking in the car.

Square Tub Granulator Offers Improvement Over Round Type

The granulator designed by the Bohnsack organization has heavy steel plate sides, and a rectangular instead of a round tub. The square construction creates a space in the corner, where stones, roots and foreign matter can collect, and can be easily removed by simply taking out the three-inch planks at the bottom of the tub. Should a large stone get into the machine and break a knife, it is only necessary to remove a few boards

This picture gives some idea of the size of the huge frost chunks set behind by the 2-yard shovel.

and push the stone and broken blade through the bottom. The knives have welded wearing surfaces of special steel.

From the granulator the clay passes through a set of corrugated conical rolls 24 inches in diameter at the large end and 31 inches long, operated at the speed of 375 r.p.m. These rolls are set ½ to ⅜ of an inch apart. The rolls discharge on a 30-inch rubber conveyor 45 feet long, which carries the clay to a second set of conical rolls, one of which is corrugated and the other smooth. These are set ⅜ of an inch apart and take out the smaller lime pebbles. Immediately underneath is a set of straight face fine grinding rolls 30 inches in diameter, with a 24-inch face set 1/16 of an inch apart, operating at 350 r.p.m.

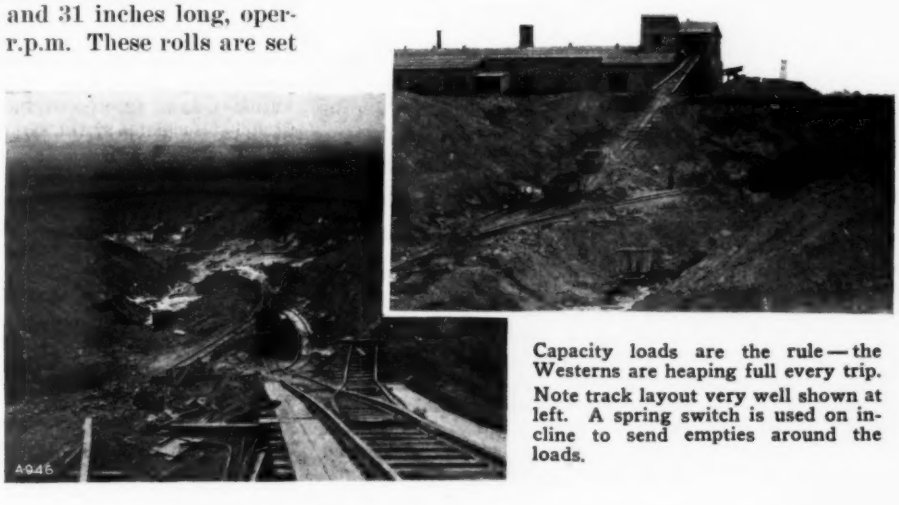
From the grinder the clay goes by another 30-inch rubber belt to a new type of pug mill to a 12-foot tub, this being built like the granulator with square tub and removable plank bottom, which helps to keep the clay from the pug mill clean.

The large brick machine is built to manufacture 350,000 bricks per eight-hour shift. Just beyond the die of the brick machine is a sand hopper which sands the top and bottom of the clay column, no further sanding being necessary. From the two continuous streams of clay delivered, bricks are end cut to proper brick sizes and then set on steel dryer cars holding 1000 bricks. These are built in such a manner that they can be handled by the setting machine in the kiln, and 600 of these cars especially designed by the Bohnsack organization are used. An electric trolley transfer car takes the cars to the tunnel dryer. After 12 hours in the dryer another electric car takes the brick to the kiln. The brick is burned in the usual manner with fuel oil, using steam for atomization. The kiln house is fitted with two cranes with 16,000 pounds capacity, which handle the setting machines and loading forks which load the brick directly into the trucks from the kiln.

The kiln building is over 1000 feet long and roofed and sided with corrugated asbestos board placed on a steel frame. The entire plant is fireproof. Included in the plant is a complete equipped machine shop, with the necessary lathes, drills and grinders, and so forth, to take care of ordinary repairs and maintenance.

Product of the Bohnsack Brick Company is consumed almost entirely in Chicago and its suburbs. Hauling is by 27 trucks of various makes, carrying from 2500 to 5000 bricks. Production of the

(Continued on page 178.)



Capacity loads are the rule — the Westerns are heaping full every trip. Note track layout very well shown at left. A spring switch is used on incline to send empties around the loads.

Forecasts of Excavation for Road Work

Each month we have added to the January forecast reports on additional states giving a brief outline showing estimates of excavation on highway construction contemplated this year. At the time of our original forecast a number of states were unable to give us any information because plans were not formulated and often depended on forthcoming legislative action. In this number we are able to add a few additional states to those previously reported.

Georgia

Forecasts on program for Georgia are not yet available.

Illinois

The following tabulation gives the present status of all unfinished grading contracts now under way in the State of Illinois. The tabulation also includes the amount of work completed during 1928.

GRADING AWARDED IN 1927 AND UNCOMPLETED JANUARY 1, 1928.

	Miles	Cubic Yards Excavation	Estimated Cost
Federal Aid	19.7	518,674	$ 308,000
S. B. I.	53.6	1,202,437	706,000
County 15d	56.9	594,158	780,000

GRADING AWARDED IN 1928.

Federal Aid	62.8	1,529,613	$ 780,940
S. B. I.	288.6	7,930,023	4,091,220
County	33.8	504,434	448,820

GRADING AWARDED IN 1929.

Federal Aid	8.7	197,558	$ 110,430
S. B. I.	25.5	544,284	321,950
County	....	.....	.....

GRADING COMPLETED IN 1928.

Federal Aid	82.5	1,878,723	.....
S. B. I.	191.4	5,279,270	.....
County	66.4	935,690	.....

PAVEMENT UNDER CONTRACT AND UNCOMPLETED MARCH 1, 1929.

Federal Aid	89	$ 2,620,000
S. B. I.	506	14,900,000
County 15d	85	3,162,000

New Hampshire

The state of New Hampshire plans new construction of approximately fifty miles of state roads (not Federal Aid). It is also planning to improve fifty miles of old road by widening, rebuilding and so forth. The State Highway Department is unable to forecast the amount of excavation required, and they also have no information on the uncompleted excavation of contracts let during 1928.

North Carolina

The 1929 program for the State of North Carolina calls for the construction of the following mileage: 80 miles to be graded and drained; 200 miles topsoil, sand clay and gravel; 40 miles of sand asphalt; 450 miles of surface treatment, topsoil, sand clay and gravel to be oiled; 20 miles asphaltic concrete; 200 miles concrete.

It is estimated that this work will cost between seven and eight million dollars. In addition to this there was approximately four to five million dollars worth of work contracted for in 1928 that was carried over to 1929.

With reference to the graded and drained roads, the estimated amount of material per mile is between fifteen and eighteen thousand cubic yards in the eastern Piedmont section of the State, while in the west and western Piedmont section the amount per mile will average between twenty and twenty-five thousand cubic yards of common excavation, and six to eight thousand cubic yards of rock. Approximately seventy-five per cent of this excavation could be moved by shovel operation.

Virginia

Final allocation of state highway construction funds for the fiscal year of 1929-1930 for the state of Virginia authorized the expenditure of $9,999,940. This is divided by districts to which funds have been allocated as follows: No. 1—Bristol District, $1,106,342; No. 2—Salem District, $1,282,775; No. 3—Lynchburg District, $1,157,255; No. 4—Richmond District, $1,328,672; No. 5—Suffolk District, $1,278,667; No. 6—Fredericksburg District, $666,868; No. 7—Culpeper District—$1,006,485; No. 8—Staunton District, $1,172,876; and, in addition, the million-dollar Gap fund which provides $875,000 for the Bristol District and $125,000 for the Staunton District. Besides the above there is available for maintenance $4,500,000. Interest on the Robertson Act loans has been allotted to each of the districts in addition to the funds shown above.

Wisconsin

The State of Wisconsin's road program for 1929 covers over 620 miles of highway construction at an estimated cost of $12,740,870, which cost includes structures and surfacing. Of this 247 miles, costing $6,132,757, will be Federal Aid projects, while 382 miles, costing $6,608,013, will be State Roads, not Federal Aid. It is impossible to make any forecast as to the amount of reconstruction, widening and so forth contemplated, as no definite plans have been made in this respect. It is estimated that it will require 5,000,000 cubic yards of excavation for carrying out the grading program outlined above, and that about fifty per cent of this will be suitable for shovel operation. In addition to the above there is approximately 350,000 cubic yards of excavation to move on work contracted prior to 1929 which is still to move. The cost of this left-over work will be approximately $200,000. Wisconsin plans 288 miles of paving construction for 1929 at a cost of $8,640,000 and 757 miles of gravel to cost approximately $7,570,000. The mileage on this later item of estimated work includes maintenance work.

Mexico

The Ministry of Communications of Mexico has issued a statement that the Government had prepared a highway construction program calling for an expenditure of 82,000,000 pesos ($39,564,000) during the six-year period 1929-1934, to be expended by years as follows: 1929, 8,000,000 pesos ($3,860,000); 1930, 12,000,000 pesos ($5,800,000); 1931, 14,000,000 pesos ($6,755,000); 1932, 15,000,000 pesos ($7,237,000); 1933, 16,000,000 pesos ($7,720,000); 1934, 17,000,000 pesos ($8,202,000). Among the highways to be constructed and the amounts estimated for each are: Ixmilquilpan-Linares, $7,237,000; Toluca-Guadalahara, $3,377,500; Puebla-Oaxaca, $2,895,000; Puebla-Veracruz, $2,412,500; San Cristobal-Suchiale, $2,412,500; San Cristobal-Merida, $4,825,000; Cuidad-Victoria-Guadalahara, $2,895,000; Guadalahara-Chihuahua, $2,412,500; Other roads, $2,895,000. The sum of 10,000,000 pesos ($4,825,000) is to be expended for maintenance.

Panama

The Trans-Isthmian highway survey from France Field to the Alhajuela dam site has been completed. From the completed survey topographical maps will be made, from which the road and estimated cost will be determined. The surveyors, under Mr. H. E. Merryman, will be transferred to Puerto Bello for a survey of the France Field-Puerto Bello road. The group under A. C. Snyder of the Pennsylvania State Highway Commission is already engaged on this survey, starting from the west end. The entire survey is scheduled to be completed before March 31, 1929.

From THE MAIL BAG

THE PITTSBURGH & LAKE ERIE RAILROAD COMPANY
Pittsburgh, Pennsylvania

March 15, 1929.

Gentlemen: I note under Southwestern Notes on page 128 of *The Excavating Engineer* for March 1929, that the New Mexico Construction Company of Albuquerque, Arizona, has been awarded contract for building landing fields at Onava, New Mexico, and also the next item stating that Ken Hodgman of Pasadena, Arizona, has been awarded contract for road work near Phoenix, and am wondering if Albuquerque and Pasadena should not have been awarded to New Mexico and California respectively. At least our Railroad Guide does not indicate stations or towns by those names in the state of Arizona, neither did the geography that was used to obscure the view of the teacher when eating crab apples, etc., at the little red schoolhouse.

Yours very truly,

(Signed) GEORGE F. MACDONALD,
Chief Clerk.

Editor's Note: We apologize. Back in the days of the little red schoolhouse we did study geography but just when the rest of the class was learning about the state of Arizona, we were no doubt eating the crabapples Mr. MacDonald mentions.

Westinghouse Achievements

In their report for "Engineering Achievements" for 1928 the *Westinghouse Electric & Manufacturing Company of East Pittsburgh, Pa.,* feature the new 44-ton H. K. Porter engine, owned by the Northern Illinois Coal Company, which is believed to be the largest gas-electric industrial locomotive actually operating. This locomotive hauls four 65-ton loaded cars of coal at each trip from the strip mine to the

tipple over occasional very steep short grades. Porter, Baldwin and Whitcomb are all building these electric locomotives using Westinghouse motors.

FIELD NOTES

Shoot Those Hard Spots!

By GEORGE L. BANKS

Starting on my forty-third year as an excavator and looking back to my old plow and scraper days and to some of the first work I did with steam shovels and modern dump wagons, I figure that about one-fourth of the hardest work on the job was just plumb useless.

You old timers know as well as I know that no considerable patch of earth is the same, there will be a boulder here and there, and in some places roots and stumps will hinder your progress. Then there will be patches of just dirt, but dirt so hard and dry that few plows would pierce it.

Did you ever strain and sweat and break single-trees and clevises over such patches in the old days?

So did I.

Did you forget that you was raised religious and rip out a few emphatic "Dams"?

So did I.

Well time passed as it has a habit of doing, and I was in charge of my first highway contract with steam shovels, six-yard dump wagons and everything modern and up to date. How proudly I watched my first steam shovel dig into the earth! It took hard, soft and rocky spots all alike.

No, hardly alike. True, it was nearly twice as long going through some of these hard spots as it was where the earth was of average looseness, but it tore them out all the same, and for awhile I was satisfied with this result.

Then one night I got to thinking how we had dynamited some of those hard spots in the old days of plows and jackass power. I knew it had paid then. And as I figured up the loss of at least half of the speed of my steam shovel in such places along with the loss of my time by dumping wagons and drivers, I felt like kicking myself that I had not blown out these places ahead of the steam shovel.

That's the way I do now up in the Hollywood hills, where I have a job of excavating that will probably last longer than I will. I have a small dynamite magazine, and even if I am confident that steam shovels really can tear out the hard shale by persistent work I put a few shots in anyway.

And everything runs as smooth as electing Hoover president. Every dump wagon comes in its turn and is loaded by so many shovel fulls of dirt and makes way for the next one.

I have the man that does the shooting do his blasting each evening after the gang pulls off, and there is practically no danger of anyone getting hurt. And the next morning the hard spots, the jutting boulders and hindering roots and stumps are out of the way and everything is ready for another record day of excavating.

Shoot those hard spots! It pays.

The EXCAVATING ENGINEER

A Monthly Publication Devoted to Excavating and Allied Subjects

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SPECIAL SUBSCRIPTION: Upon application on card inserted in this number, subscriber's name will be placed on Rotating List, whereby he will receive The Excavating Engineer frequently (not regularly) free of charge.

THE EXCAVATING ENGINEER PUBLISHING CO.

F. O. Wyse, Manager-Editor Arnold Andrews, Associate Editor

South Milwaukee, Wisconsin

Printed in the U. S. A.

The Business Situation

If the volume of business for 1929 may be estimated from the activity of business so far this year, the year should be a very good one. Basic industries have maintained a very high rate of activity during the first two months and a half of this year, and although money rates have continued very firm and have tightened a little in the last few days, there has been thus far little evidence that business in general has been seriously menaced by it.

Steel operations are continuing at very high levels, partly due to demands from automobile manufacturers, railroad equipment, farm implements and machinery. Steel buying is active, with immediate deliveries emphasized.

Automobile production set a record in January and another in February.

From annual statements now being made public it is apparent that representative concerns in most industries find themselves in a very sound position. As might be expected, good times or prosperity have not been uniformly enjoyed by industries, but some have had high earnings while others have been "not so good." Cotton markets have been very active. Silk manufacturers are looking forward to good business in the immediate future.

February construction contracts awarded in the 37 states east of the Rocky Mountains shows a decline from January and from the preceding February, according to F. W. Dodge Corporation. Last month's total, $361,273,900 in amount, was 12 per cent less than the January 1929 record, and it was 22 per cent below the total for February of last year. The decreases mentioned above may be partly attributed to the fact that last month had four business days less than the preceding month, and one business day less than the corresponding month of a year ago.

Two districts made new high totals for the month of February, the new records being reached by New England and Texas. Two other districts, Middle Atlantic States and the Pittsburgh District, reached totals which were next to the highest ever recorded for February.

The February building and engineering total included the following items of importance: $129,486,400, or 36 per cent of all construction, for residential buildings; $68,265,500, or 19 per cent, for commercial buildings; $57,593,000, or 16 per cent, for public works and utilities; and $56,092,100, or 16 per cent, for industrial projects.

Last month's contract total brought the amount of new construction work started in the 37 Eastern States since the first of this year up to $771,241,800, as compared with $892,500,000 for new construction started during the first two months of last year, the decrease being 14 per cent.

New contemplated projects reported during February reached a total of $772,621,600. This figure was 6 per cent less than the amount reported during January of this year, and it was 18 per cent below the amount reported during February of last year.

As indicated on the charts, time money rates are remaining very steady at quite a little above the

WEEKLY BUSINESS INDICATORS

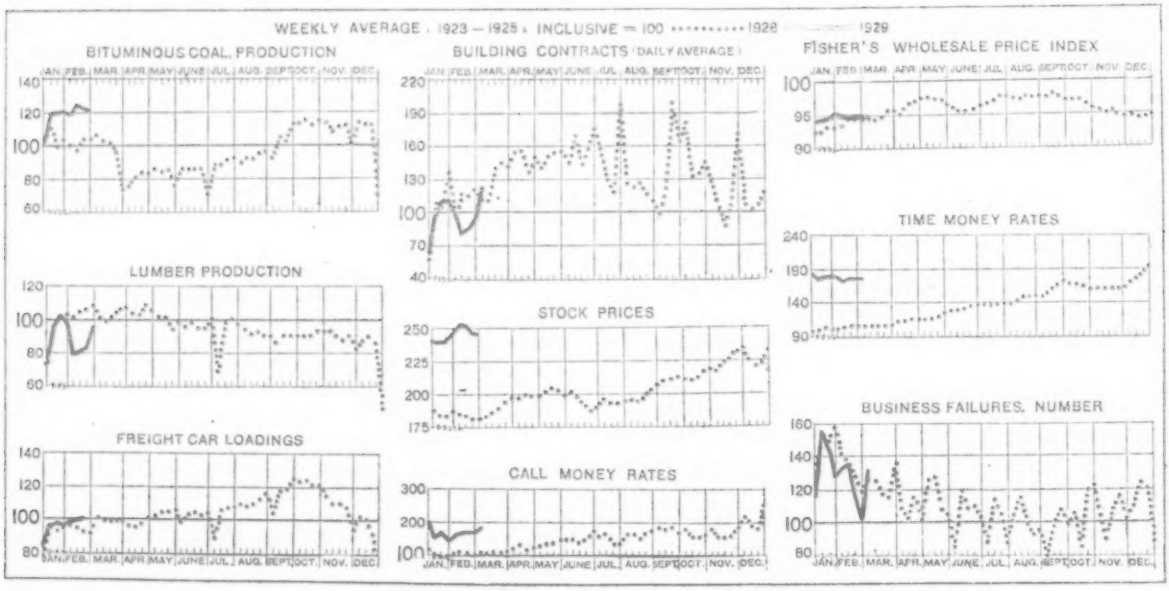

WEEKLY AVERAGE, 1923—1925, INCLUSIVE = 100 ..... 1928 ——— 1929
BITUMINOUS COAL, PRODUCTION
BUILDING CONTRACTS (DAILY AVERAGE)
FISHER'S WHOLESALE PRICE INDEX
TIME MONEY RATES
LUMBER PRODUCTION
STOCK PRICES
BUSINESS FAILURES, NUMBER
FREIGHT CAR LOADINGS
CALL MONEY RATES
JAN. FEB. MAR. APR. MAY JUNE JUL. AUG. SEPT. OCT. NOV. DEC.

figure for a year ago. It remains to be seen whether this condition can be adjusted without affecting business to its disadvantage.

Business failures increased during the first part of March. The price of copper (not shown) has risen thirty per cent above the price of a year ago. Bituminous coal production is maintained at a very good figure, although a seasonal reduction in output is to be expected very soon.

What's Wrong With This Story?

"Will you please drive off the track?" asked the motorman. The truck driver promptly pulled to one side.

"Thank you, ever so much," added the motorman, with a smile.

"You're very welcome," responded the truck driver, "but you must pardon my seeming carelessness. I had no idea your car was so near."

Improved Erie Portable Two-Piece AggreMeter Plant

The Erie Steel Construction Company have designed a new bin especially for platform operated AggreMeters. The bin bottom is off-center, which allows more floor area and shelter for the operator. It is also impossible for the aggregates to arch in a bin of this type because the sides are almost perpendicular.

This Type G AggreMeter Plant is especially suited for road and general contracting work where portability is essential, and can also be adapted to central mixing plants for loading direct into the mixer hopper.

The new portable bin is built in 60, 73, 74, and 91-ton capacities. The 60 and 74-ton capacities are shipped in two pieces, with AggreMeter attached, so that it is only necessary to put the two sections together. The top section is flared on two ends only in the 60 and 74-ton capacities, while the 73 and 91-ton capacity bins have four flared sides to the top section.

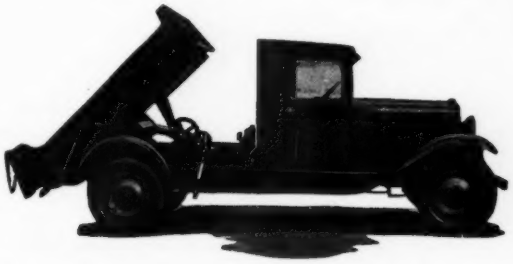
The customer can purchase a 60-ton Type G AggreMeter Plant and at a later date make it into a 73, 74, or 91-ton plant by simply adding the correct top section. The 60-ton frame is standard and of ample strength for all sizes of Type G Bins.

Further information can be secured by writing the *Erie Steel Construction Company, Erie, Pennsylvania,* and referring to *The Excavating Engineer.*

A New Hughes-Keenan Truck Dump Body with Quick-Acting Hand Hoist

This new quick-acting hand hoist dump, designed by *The Hughes-Keenan Company, Mansfield, Ohio,* well-known manufacturers of dump truck equipment, is designed to meet an insistent demand.

Very little effort is needed to handle maximum load when dumping. The hoist is double reduction with double lifting arm, which lifts body evenly regardless of position of truck. Hoist is exceptionally sturdy — a quick-acting model that dumps full load



with five easy turns of the crank, depositing it well clear of the wheels and truck frame.

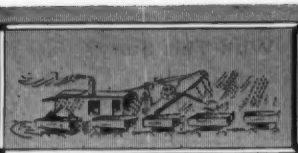
Rockers are built of structural steel sections equipped with special devices that, while holding them firmly in place, permit them to move freely in dumping. Two other distinct advantages are found in the safety pawl and ratchet device that permits body to be positively held at any desired dumping angle, and the special lock that holds body rigidly when in loading position. This protects the hoist mechanism from jars and strains that the bouncing action of an unlocked body sets up.

Bodies are made of rugged 10-gauge steel plates, sides and bottom are one piece. The whole job is strongly reinforced and electrically welded throughout. Materials will dump quick and clean, because inside of body is absolutely clear of all bolt and rivet heads.

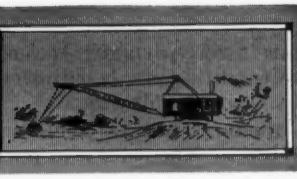
These bodies are made in two sizes — either 1-yard or 1½-yard level full and with extension sides, 1½ or 2-yard level measure. All are equipped with plain double-acting tail gate, which is released for dumping by a lever on the right side of body. This is standard equipment. This body is furnished for and easily mounted on almost any make of light truck.

For full information write *The Hughes-Keenan Company, Mansfield, Ohio,* mentioning *The Excavating Engineer.*

"Modern girls," says writer, "are given to wearing precious stones — and precious little else."



SHOTS FROM THE FIRING LINE



New York Notes

BY T. A. BURNS

We are reliably informed that Ed. Ryan, of Ryan & Davis, found it necesary to cancel his order for a Levine two-seater cabin plane, with partition removed, because his partner, Mr. Davis, insisted upon the purchase of another Gas + Air machine.

Carlo Petrillo, Inc., New York contractor, is busy removing earth from the cut for the new subway from 9th and Prospect Park to 11th and Prospect Park, Brooklyn. The above picture shows the second of his Bucyrus-Erie 41-B steam shovels breaking ground on this new job. Dick Byers is superintendent and George Hahn is running the shovel. These 41-B Bucyrus-Erie steam machines are giving a very creditable performance, and Mr. Petrillo is excavating from 20 to 30 per cent more per hour with them than gasoline and gas-electric machines are turning out on this and adjacent jobs.

Canada

Toronto and Vicinity

BY C. F. ENGLAND

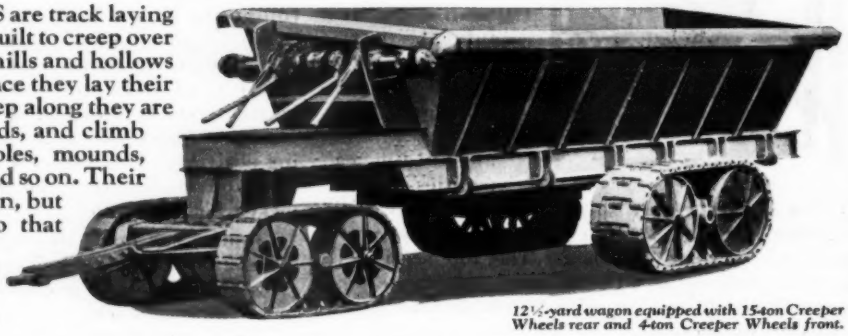
The County and Township Engineers and Road Superintendents of Ontario held their conference in Toronto on the last three days of February with a very large attendance. Many important matters were discussed, and we understand much benefit was derived by all.

The Ontario Good Roads Association held their annual meeting here on February 27, 28 and March 1. The usual large number attended, and in addition to the business transacted it gave, of course, the opportunity for the renewing of the many acquaintances.

From information going around at the present time, and, the number of projects being discussed, it looks as though 1929 will be a good year in the construction industry.

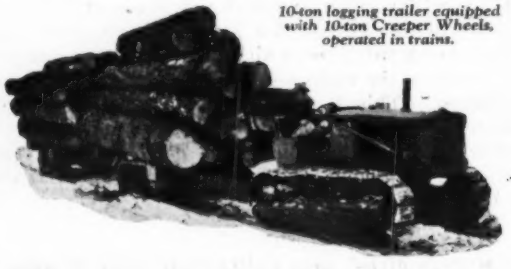
CREEPER WHEELS NEED NO ROADS

CREEPER WHEELS are track laying type equipment, built to creep over the top of mire, mud, hills and hollows without digging in. Since they lay their own tracks as they creep along they are not dependent on roads, and climb easily over stones, holes, mounds, stumps, roots, refuse and so on. Their wide tracks do not cut in, but pack the soft earth so that after several trips you have a road where none previously existed.



12½-yard wagon equipped with 15-ton Creeper Wheels rear and 4-ton Creeper Wheels front.

Creeper Wheels are very flexible. Simplicity of design and construction with the use of roller bearings make it possible to pull heavier loads without increasing tractor power and thereby reduce your hauling costs.



10-ton logging trailer equipped with 10-ton Creeper Wheels, operated in trains.

Creeper Wheels are manufactured in four sizes: 4-ton, 6-ton, 10-ton and 15-ton capacities.

If you are purchasing new hauling equipment, be sure to specify that it be *Creeper Wheel* equipped.

Write now for further information.

THE CREEPER WHEEL CO.

READING, PA., U. S. A.

Why tremendous traction

Here Are Three Powerful Reasons:

1, *2016 square inches of traction surface on this "40." It is "every inch a tractor."*

2, *Draw Bar pulls down on a slight angle from the center (see illustration) and adds traction in proportion to the load.*

3, *The engine and all superstructure weight is directly over the crawlers and gives "balanced traction."*

Bates Steel Mule

JUST a few of the many strong reasons are shown above why the Bates Steel Mule Tractors operate so efficiently.

The Bates Tractor Book gives completely the important essentials of a tractor that you should know about before buying.

Let us prove to you why the Bates Steel Mule is "Every Inch a Tractor."

Write today for your copy of the Bates Tractor Book

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FOOTE BROS. GEAR & MACHINE CO.
206 No. Curtis St.
CHICAGO ILL.

Please send me copy of the Bates Tractor Book.

Signed_____

Address_____

9-28

FOOTE BROS. GEAR & MACHINE CO.

Road Machinery Division
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Sales and Engineering Offices in All Principal Cities, U. S. A., and Canada

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SHOTS FROM THE FIRING LINE — Continued

Pittsburgh and Vicinity

BY J. S. WEAVER

Richard Turner is operating an Erie shovel for The Wilkinsburg Trucking Company at Pittsburgh.

The R. M. Netherland Company, Pittsburgh, Pennsylvania, was low bidder on the Monument Hill work. This is one of the largest excavating contracts let by the city in some time.

The Woods Construction Company are doing nice work on the new P. & L. E. passenger yards at Pittsburgh, Pa.

A. G. Rothey have two Bucyrus-Erie shovels working at Douglas, Pennsylvania, on improvements for the Pittsburgh Coal Co.

The W. F. Trimble Sons Co., Pittsburgh, Pennsylvania, are making rapid progress on the Pennsylvania Railroad improvements at Sewickley, Pennsylvania. The Pennsylvania engineers expect to complete the Sewickley improvements by spring.

William Martin, the well-known shovel operator, was a visitor at the Pittsburgh office a few days ago. "Bill" is looking hale and hearty after a vacation on his Indiana, Pennsylvania, farm.

We wish to extend our best wishes to George Bowman in his new position as secretary of the Steam Shovelmen's Union at Pittsburgh, Pennsylvania. Also to Clark Hughes, the retiring secretary, who served the office so long and so well.

Booth & Flinn Company, Pittsburgh, Pennsylvania, was awarded the contract for the Pike Street improvements at Pittsburgh. This work is in connection with Pennsylvania Railroad improvements which will cost several million dollars.

On Monday, February 11, 1929, ground was broken for the new Byers Pipe Mill at Baden, Pennsylvania.. This will be the largest wrought iron pipe mill in the world, aggregating fifteen million dollars in cost of construction.

McCrady Brothers have received several contracts from the City of Pittsburgh for street improvements in the past few days.

The Wilkinsburg Contracting Company are making the dirt fly on their East End, Pittsburgh, contract. They are using two Bucyrus-Erie steam shovels and heavy tractors and trucks.

Ohio Notes

BY J. I. MORAVEC

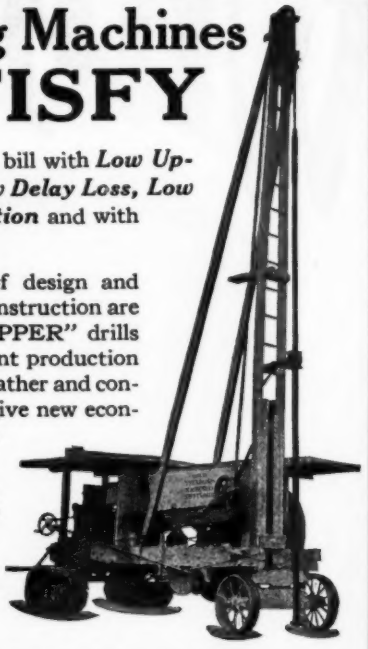
Operator H. J. Potter of Fremont, Ohio, sends us the above picture taken on Sylvania Avenue at Toledo, Ohio, two years ago. At that time he was operating the above Erie steam shovel for Arthur S. Langenderfer, contractor.

"CLIPPER" Blast Hole Drilling Machines SATISFY

They fill the bill with ***Low Upkeep Cost, Low Delay Loss, Low Rate Depreciation*** and with ***Record Runs.***

Simplicity of design and ruggedness of construction are built into "CLIPPER" drills to insure constant production in all kinds of weather and conditions and to give new economies in blast hole drilling.

Write us for descriptions of the ***"CLIPPER"*** built to fill your requirements.



THE LOOMIS MACHINE CO.

(Established 1842) K Street, Tiffin, Ohio

DON'T GAMBLE

with Night-time delays

MOON Gas-Electric Lighting Plants
Direct Connected
Capacities—1½, 2¼, 3, and 4 KW

AVOID those costly night-time delays by using a lighting plant which has proven its dependability by actual performance. In the MOON Gas-Electric you get a lighting plant that will handle your job from every angle. Full ball-bearing, fully enclosed, auxiliary pulley—these and many other MOON features mean reliable, flexible service, night after night.

A MOON Lighting Plant on the job is your best insurance against expensive night-time delays.

Write for descriptive Bulletin No. 15.

THE MOON MANUFACTURING CO.

108-128 No. Jefferson Street, CHICAGO

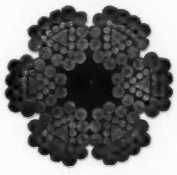
"HERCULES" RED-STRAND REG. U.S. PAT. OFF. WIRE ROPE

A Dependable Wire Rope for Shovels and Excavators

The money-saving ability of "HERCULES" **[Red-Strand]** Wire Rope is in the yardage it is able to handle for each dollar of its cost.

"HERCULES" is made in both Round Strand and Patent Flattened Strand constructions in order to meet all working conditions.

If you have never used "HERCULES" we would like to have you give it a trial. If you will tell us the make and model of your machines we shall be glad to suggest the right construction for your equipment.



Made Only by **A. Leschen & Sons Rope Co.** *Established 1857*

5909 Kennerly Avenue

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New York Chicago Denver San Francisco

In writing to A. Leschen & Sons Rope Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Detroit and Vicinity

BY P. M. RICHARDS

C. L. Climar was low bidder on a large road job at Flint on March 9th.

J. A. Mercier-Brandon Company are using one of their Bucyrus-Erie 50-B steam machines and their Bucyrus-Erie 30-B Diesel on the City Water Department Reservoir excavation on West Warren Avenue, Detroit.

The American Aggregates Corporation have placed another Bucyrus-Erie 50-B steam shovel in operation in the Fuller-Becker pit at Oxford. This is their second 50-B in operation in Oxford. They also are operating a Class-24, a Class-14 (shown above) and a B-2 in the Oxford and New Hudson pits. These properties are under the management of E. E. Mills who has recently been transferred to the Michigan territory from Urbana, Ohio.

THE cost of any car used for haulage purposes is determined by its life, by the service it renders—and by its cost of maintenance.
Koppel cars are built to render a definite service—designed to build good will and please the user.
The Koppel Line is complete—we build cars for every haulage use.
KOPPEL CARS
Koppel Industrial Car & Equipment Co.
KOPPEL, PENNA.
Sales Offices
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KOPPEL

PREFORMED WIRE ROPE

TRADE TRU-LAY MARK

(Reg. U. S. Pat. Off.)

AMERICAN CABLE COMPANY, *Incorporated*

Grand Central Terminal Building
NEW YORK, N. Y.

District Offices:
Chicago Detroit Philadelphia Pittsburgh
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An Associate Company of the American Chain Company, *Inc.*

Dominion Wire Rope Company, *Limited*, Montreal
Sole Canadian Licensed Manufacturers

Consider these

7 TRU-LAY *Advantages*

1 Resists unstranding
2 Longer life
3 Balanced load on strands
4 No high strands
5 More easily spliced
6 Makes Lang Lay practical
7 Resists kinking

Your name and address bring the facts about Tru-Lay economy

ERIE Buckets

NOW HAVE HYATT Roller Bearings IN

GUIDE SHEAVE
↓
RETURN SHEAVE

AND

SHEAVE CLEANERS
↓
POWER ARM SHEAVES

WILL MAKE ANY CRANE BETTER—

HOLDING AND CLOSING LINES END IN WEDGE AND SOCKET

BECAUSE they are designed to resist the lifting tendency of the bucket while closing.

BECAUSE the closing mechanism is a combination of the lever arm and block and tackle principle, having the closing sheaves at the extreme end of the power arm, thereby exerting the greatest amount of leverage. This also causes the bucket to overhaul quickly.

BECAUSE we are receiving repeat orders from Contractors, Railroads, U. S. Engineers, State Departments and Material Yard Owners from every State in the Union.

STRAIGHT ROPE LEADS NO S BENDS

Roller Bearings substitute rolling for sliding friction, thereby greatly increasing the useful life of the bucket. A special oil seal keeps in the oil and keeps out the dirt which increases the life of the bearing.

Stellite is a ribbon of metal harder than steel applied where the wear is greatest. Let Stellite protect your cutting edges.

Stellite Special Lips

Will outwear three sets of ordinary lips and help maintain perfect scoop alignment

Send for a Copy of Our Bucket Catalog

ERIE STEEL CONSTRUCTION CO.

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In writing to Erie Steel Construction Co. please use post card bound in the center of this number.

STRENGTH

The ability to stay with the job - the heritage of mechanical supremacy

FROM traction to boom this handy little Utility Crane is built to deliver a maximum of service at a minimum of cost. Over thirty years of successful experience in building heavy duty material handling equipment, brings to Buckeye owners a crane with the built-in spirit of wanting to do, as well as the ability to do the job at hand.

There is always a job for this Buckeye—it is readily convertible to crane, clamshell, dragline, ditcher or backfiller, and its service is limited only by the ingenuity of its operator. It can be used profitably on many jobs for which heavier, less flexible and more expensive Cranes are not economical.

Just check these features—Timken roller bearings, full-circle swing and two speeds for all operations, Twin full-length Alligator (crawler) traction units—each driven separately to give a short turning radius, telescopically adjusted boom and efficient one-man control. Price of this Utility Buckeye is $4,750 f. o. b. Findlay, Ohio, less Bucket and Cab. Write for our special Crane bulletin.

"Every Day It Pays Its Way"

THE BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

There's a Buckeye Sales and Service Office near You

for over thirty years Buckeye

SHOTS FROM THE FIRING LINE — Continued

We are pleased to report that Charles Killen of the Lima Stone Company has sufficiently recovered from his recent illness to be back on the job. Their Bucyrus-Erie 100-B shovel is now in operation, being handled by F. C. Boop as operator under A. W. Morse, superintendent.

Laramie Bros. have added two new B-2 machines to their fleet of Bucyrus-Erie machines.

S. J. Fattore has completed his section of the Southfield Sewer west of Birmingham.

L. P. Johnson is in charge of the excavation on A. Phelps & Sons sewer work in the south side of Dearborn.

Wayne County Road Commission have installed a Bucyrus-Erie 1030 clamshell machine at their Wayne yards for material handling. They also have one 41-B and three Gas + Air machines.

Bill Teeters is now handling J. A. Mercier-Brandon's 30-B Diesel dragline.

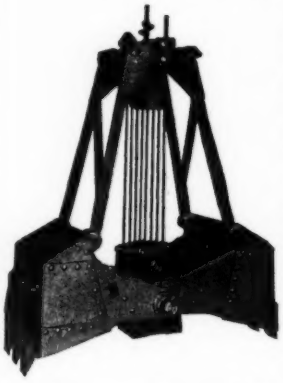
Spencer, White & Prentis have been awarded the open cut on the Canadian end of the Detroit-Windsor Tunnel, so we expect to soon see Charlie Roger's trucks on the streets of Windsor.

Illinois Notes

HENRY ANDERSON

Henry Anderson of the firm of Anderson Brothers Construction Company of Rockford, Illinois, died shortly after an operation on February 26th to remove his foot which had

One type bucket for many jobs



NO matter what the job may be — fast handling of light materials — moving heavy crushed stone or aggregate — excavating hard-packed or frozen soil — a change in reeving is all that is needed to fit the Hayward Class "K" Clam Shell to the work. 3 part reeving gives speed — 5 part is for average work — 7 part where utmost power and strength are needed.

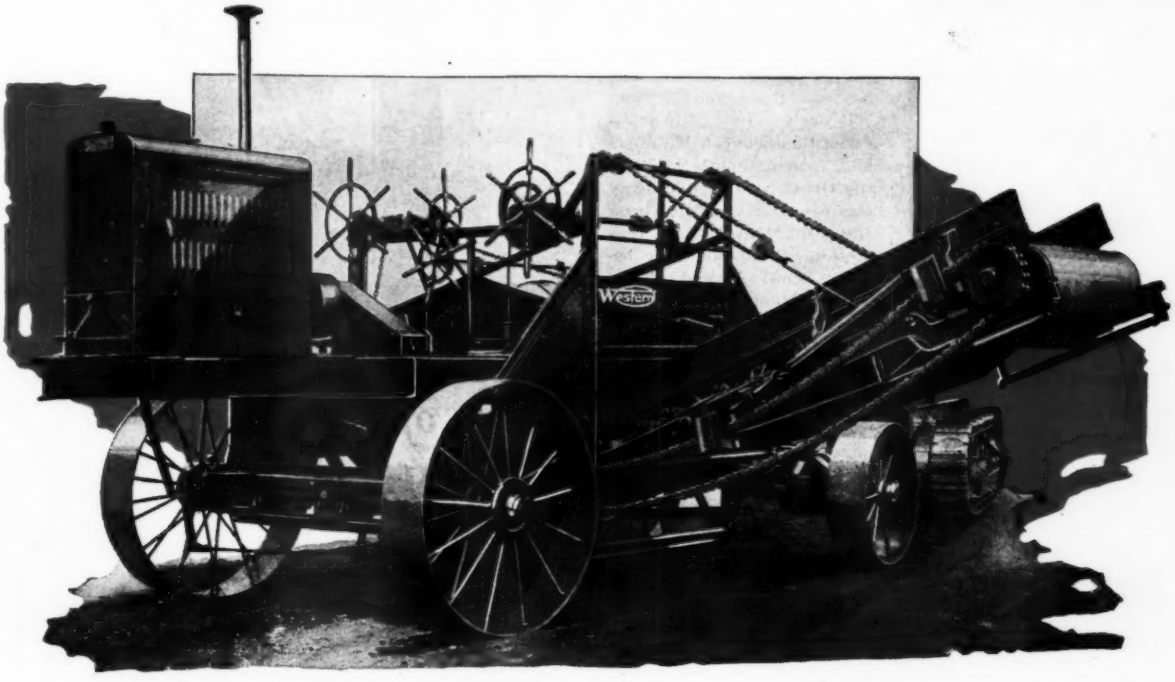
Hayward Class "K" Buckets are fully described in Bulletin 653. Write for your copy.

THE HAYWARD CO.
52-54 Church St., New York, N. Y.

Hayward Buckets

A New Elevating Grader

That Works in Sand or Wet Ground



THE LEVEE SPECIAL

AN elevating grader that will operate under adverse weather conditions and in normally unsuitable material has been designed and built by the Western Wheeled Scraper Company. Its belt is driven by a motor mounted on the rear of the machine. The Levee Special, therefore, is able to elevate dirt when models on which the belt is driven from the rear axle have insufficient traction to operate. Delays caused by wet ground and sand are over.

The capacity of the Levee Special runs from 40% to 75% more than the same size machine with the belt driven from the rear axle. A complete description is contained in Bulletin 29-BK. Write for a copy today.

Western Wheeled Scraper Company
Aurora, Illinois

WESTERN

DUMP CARS AND GRADING EQUIPMENT

In writing to Western Wheeled Scraper Co. please use post card bound in the center of this number.

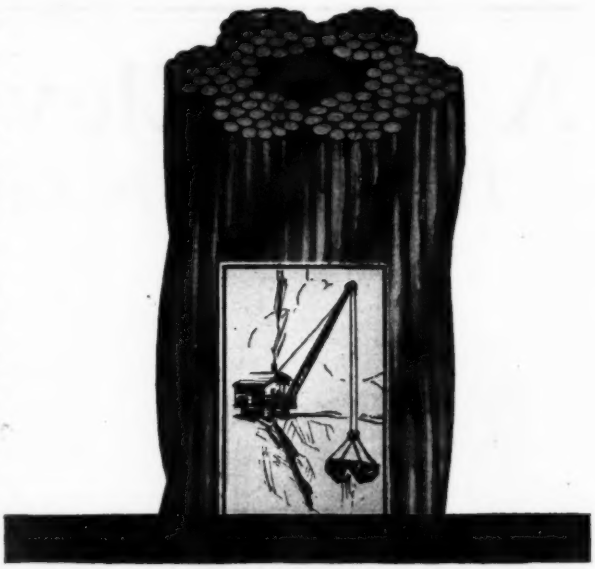
SHOTS FROM THE FIRING LINE — Continued

been crushed the day before Christmas under the bucket of one of his company's steam shovels. Mr. Anderson was born March 26, 1865, in Sweden, and came to this country in 1884. He, his brother Frank and his father began in the grading business about 1888. Work they have identified themselves with includes grading of the Blackhawk Trail Highway between Oregon and Byron, Illinois; the Ettrick and Norton Railway between Blair and Ettrick, Wisconsin; the Milwaukee Coast line between McIntosh and Lemon, South Dakota; the Great Northern Railway between Lewiston and Grass Range in Montana; and that section of the Soo Line between Outlook and White Tail in Montana.

Henry and Frank Anderson

Mr. Anderson was a lover of animals, always having a large number of horses and mules for his work, and even now, at a time when motor power is used more than horse power, men who were interested in good stock made special trips to see these high-grade animals. Many readers of **The Excavating Engineer** have known Henry Anderson and will learn with sorrow of his passing.

He is survived by his brother Frank and a sister Mrs. A. Braconier. Two nephews, Frank and Robert Braconier, are connected with the Anderson Brothers operations.



There Are Many Grades *of* Wire Rope

but it's the Right Grade for the Job that Counts!

Solve your Wire Rope problems by using—

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STEEL & WIRE COMPANY

WIRE ROPE

American Steel & Wire Company

Subsidiary of United States Steel Corporation

Sales Offices: Chicago New York Boston Cleveland Worcester Philadelphia Pittsburgh Buffalo Detroit Cincinnati Baltimore Wilkes-Barre St. Louis Kansas City Minneapolis-St. Paul Oklahoma City Birmingham Atlanta Memphis Dallas Denver Salt Lake City

U. S. STEEL PRODUCTS COMPANY
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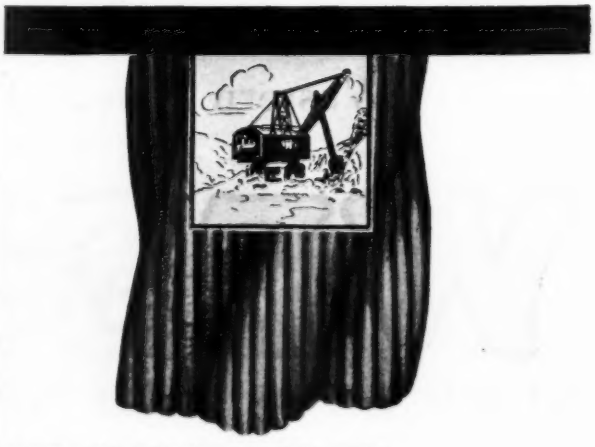

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FOR SAFETY FIRST

YOUR Safety First program should include Superbestos metallic moulded Brake Blocks and Superbestos Brake Linings for all friction uses. Superbestos products are safe because they do not absorb oil or moisture, because they are not affected by heat or cold, because their action is always smooth, positive and certain.

Control of Superbestos equipped machinery is always unfailingly in the operator's hands.

Not only will Superbestos give you safer operation but it will speed your production and cut repair costs.

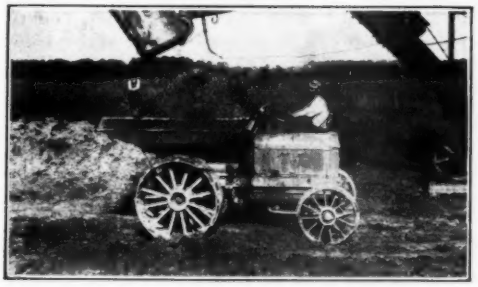
A trial order will convince you. Your money goes back if you are not satisfied.

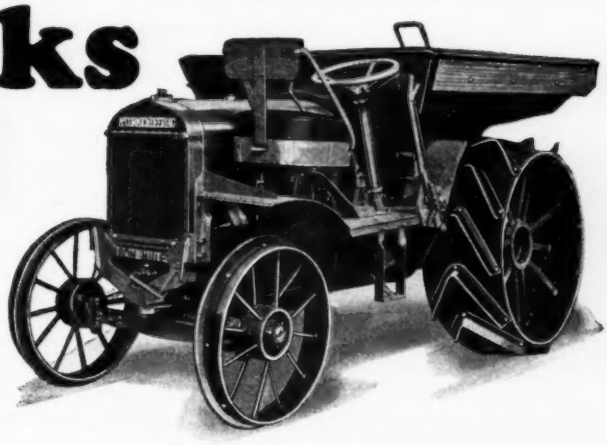
The Mikesell Co.

1223 South Wabash Avenue, Chicago, Illinois

Plant and Works, Wabash, Indiana

More Profitable than Trucks ... MUCH





HERE'S a monster profit maker. A short haul dirt mover that will lick anything on 4 wheels or 4 legs. It will haul a huge load in places where trucks can't even go empty. It's almost impossible to stick it.

Look at it how you will, the "Iron Mule" is the most adaptable dirt mover ever offered to contractors. It's a complete tractor dump — a gravity dump body, mounted on the 10-20 McCormick-Deering Tractor which has specially designed, heavy duty French & Hecht wheels.

It's easy to handle — will travel a ploughed field as readily as a Macadam pavement and a steep grade cannot check its go-ahead traction.

Dumping mechanism works positively — uphill or down — whether the unit is listing to right or left. "Iron Mules" can spot under shovels without waste of a second because driver is always facing load. He can run square up to fills without having to back up. The hefty body is designed for bull-dozing. Trucks and wagons can't build their own road. "Iron Mules" can and do — as they go.

4 YARD

There are hundreds of "Iron Mules" in use. The State Highway Department of California has a fleet of 60. Even trucks have been discarded in preference to them by dozens of contractors.

Write for illustrated Broadside — know all about "Iron Mules". And if you want to see one in action, we'll tell you where. And you will, if bigger profits-per-load mean anything to you — if you want a dirt-moving unit that makes trucks and teams look like liabilities on short hauls.

2 YARD

THE HUGHES-KEENAN COMPANY, MANSFIELD, OHIO

"IRON MULE"

TRADE MARK REG. U.S. PAT. OFF.

TRACTOR DUMP

POWERED BY 10-20 McCORMICK-DEERING

In writing to Hughes-Keenan Company please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Cleveland Notes

BY WILLIAM WELCH

The accompanying illustration shows four very popular men connected with the Cleveland Division of the Great Lakes Dredge & Dock Company at Whiskey Island, Cleveland, Ohio. They are left to right: John Rossiter, Chief Clerk for yards at Whiskey Island; Harold Quast, Chief Engineer of Steam Derrick 57; Joe Hehnen, Chief Engineer of Diesel-Electric Derrick 55; A. Behr, Master Mechanic.

St. Louis Items

BY A. J. KOENIG

The largest yardage of levee construction contracts ever to be awarded in the Memphis engineer district will be advertised for about May 15th and contracts let about 30 days later. Contracts for the construction of 24,000,000 cubic yards of levee will be let. The work includes construction of the big setback levee of the New Madrid floodway beginning at Bird's Point and extending twenty-nine miles toward New Madrid; riverside enlargement in the lower St. Francis District, above and below Wilson, Arkansas, approximately 3,000,000 cubic yards; enlargement of the existing levee at Helena, Arkansas, 1,000,000 cubic yards; riverside enlargement below Helena, 1,000,000 cubic yards. Lower St. Francis levee district above Gayoso, 1,400,000 cubic yards, and near Blytheville, 365,000 cubic yards.

The U. S. Engineers office at St. Louis, Missouri, will receive bids up to 11 A. M., April 2nd, for the construction of piling dikes on the Mississippi River at the following points: 1200 linear feet at Penitentiary Point, Illinois; 4000 linear feet at Fort Chartres, Illinois; 200 feet at Lecour Island, Illinois; 2200 feet at Swifts Sure Towhead, Illinois; 5600 feet at Brooks Point, Illinois; 1000 feet at Eliza Towhead, Illinois. Major John C. Gotwals, District Engineer.

The Everglades Construction Corporation has approximately 250,000 cubic yards of good, short-haul, borrow work on their Illinois Highway contract near Cache, Alexander County, Illinois, to sublet. This work is suitable for combination team, caterpillar trailer outfit or for a railroad car outfit. If interested, communicate with them at Box 776, Cairo, Illinois.

THE SANDERSON CYCLONE DRILL CO., ORRVILLE, OHIO

DRILLS

and drill tools for every kind of Big Blast Hole Drilling

Catalog Mailed on Request

Items excerpts from the "Columbus Dispatch" and "The Ohio State Journal" of Feb 8th and 9th, 1929, tell the story. The Columbus Fire Department has 13 No. 14 Carbic Flood Lights.

Carbic Light carries through!

FIGHTING one of the most stubborn and inaccessible fires they had battled for years and handicapped by dense clouds of smoke, twelve companies of Columbus, Ohio, firemen found Carbic Light the only light that would carry through and enable them to get their lines to the roofs of adjoining buildings.

Fighting time and delay, contractors and engineers also are taking advantage of the unusual ability of Carbic Light to carry through. The great power in the clear white rays of this light is perfectly diffused. There is no glare and no dark shadow. It penetrates—carries through smoke, dust or fog—making night work an economical solution of hurried jobs.

Your Night Shift Can Hustle With

CARBIC LIGHT

OXWELD ACETYLENE COMPANY

Unit of Union Carbide and Carbon Corporation

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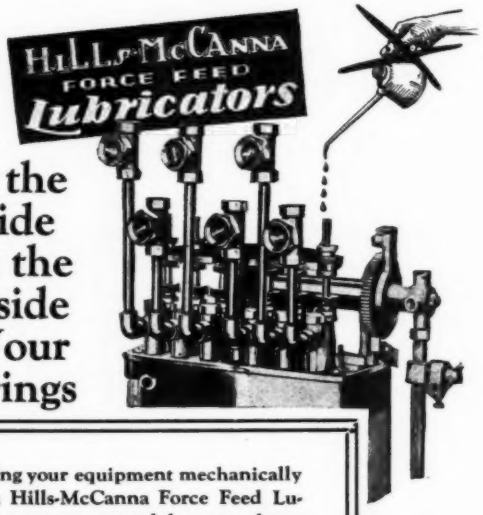
SAN FRANCISCO: Adam Grant Building

Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.

CARBIC



H.L.L.-McCANNA FORCE FEED *Lubricators*

Oil the Inside Not the Outside of Your Bearings

By oiling your equipment mechanically with a Hills-McCanna Force Feed Lubricator you are assured that every bearing and gear that needs oil gets it regularly and positively, no matter what the temperature, viscosity of oil or pressure may be.

H.L.L.-McCANNA CO.

2349-53 NELSON ST. - *Chicago*

THE MOST COMPLETE SERIES OF ALLOYS FOR INDUSTRIAL USE

FORCE-FEED LUBRICATORS • PROPORTIONING PUMPS • TANK CAR VALVES

Have you adopted the *"non-skid"* standard for your bucket buying, too?

All tires of today are skid-proof—and you can now get a dragline bucket that measures up to this same standard.

You don't see a WILLIAMS "Double-Arch" Dragline skidding over the top.

Exact design, with correct distribution of the weight, makes this bucket a real digger. One that fills itself in twice its own length, even on a shallow stripping cut. It gets its full loads faster—which means bigger output.

And you never see this bucket drawing in at the sides—

Because its rigid cast alloy steel bridge above, and heavy cast steel digging lip below, provide a *double arch* that gives this bucket double rigidity.

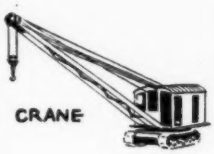
Write for our Bulletin "DS-1" giving full description, and reports from contractors who know.

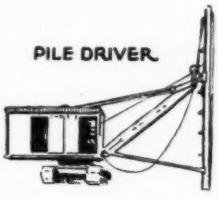
G. H. Williams Company
603 Haybarger Lane, Erie, Pa.
Branch Offices: New York, Pittsburgh, Chicago

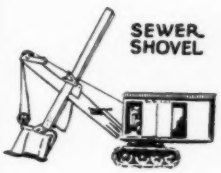
The complete WILLIAMS line of Clamshell and Dragline Buckets includes the exactly right bucket for your work.

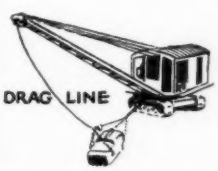
WILLIAMS
FAST-DIGGING BUCKETS

Steady, Firm Stick-to-it-iveness









That "knows when to let go"

When a brake or clutch takes hold with easy firmness, holds like grim death and then lets go with the same smoothness and ease with which it took hold, you know you have a good asbestos block. If in addition to this you have a block that stands up under the severest service you know that you have the best there is to be had for excavating machinery brake and clutch linings.

ASBESTOS

blocks and linings are the result of the most careful selection that we know how to make. They are exactly suited for the machine for which you buy them.

Let Us Experiment

Friction materials sold by us for use on excavating machinery are selected only after the most careful experiment—the most careful trying out of the material in actual field service. You can take advantage of this work of ours, gain the benefit of our careful study by purchasing your blocks and linings from us—they cost no more.

Write now for quotations.

BUCYRUS-ERIE COMPANY

BUCYRUS ERIE

Specialty Department
South Milwaukee
Wisconsin

JOHNSTON BOILERS IN SIAM

Operating at peak capacity year after year, three eight-hour shifts per day, seven days per week with varying fuel and bad water, is not unusual service for boilers on contractors' equipment.

Where nothing but the best of boiler service will do, you will find Johnston Boilers on the job. They have proven their dependability the world over.

DEMAND THIS TRADE MARK

JOHNSTON BROS. INC. FERRYSBURG MICH. DATE ORDER Nº BOILER Nº

JOHNSTON BROS., Inc.

Specializing in Boilers for Contractors' Equipment

FERRYSBURG, MICHIGAN

GREDAG LUBRICANTS

REG. U.S. PAT. OFF.

SHOW UP WELL UNDER THE MOST SEVERE CONDITIONS

WATERPROOF, WEATHERPROOF, SHOCK PROOF AND EFFICIENT

Start the season right. Profit by the experience of leading makers and operators of shovels, cranes, hoists, ditchers, crushers, conveyors and mixers, who use and recommend these time-tested aids to continuous and economical operation. Write for catalog and information.

ACHESON GRAPHITE CORPORATION

Unit of Union Carbide UCC *and Carbon Corporation*

NIAGARA FALLS, NEW YORK

Here the Track Machine is taking the place of a jack crew, raising the track on a railroad construction job.

Raising Track Without Jacks

This modern labor-saving development with its various attachments is suitable for any track raising, shifting, ballasting or steel re-laying job. Wherever used it has proven to be a great saver in time and labor. Its performance will surprise you.

Write for Bulletin GR-8.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK MACHINE

In writing to the advertisers on this page please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Road contracts amounting to $2,000,000 for 63 miles of paving and 44 miles of grading and drainage will be let by the Tennessee State Highway Commission on April 12th. Bids will be received up to 10 A. M. on 13 projects at Nashville, Tennessee.

W. P. McGeorge & Co., Pine Bluff, Arkansas, have contract for the construction of five miles of railroad for the Phoenix Utilities Co. This track is to connect the Missouri Pacific Lines at Hot Springs with the Carpenter Dam on the Ouachita River.

Hugh R. (Hickory) Smith of Charleston, Missouri, has idle a steam shovel, teams, caterpillar tractors and wagons. Any one interested in an outfit of this kind can get in touch with him at Olmstead, Illinois.

Z. Z. Mitchell of Clinch-Mitchell Co., Chicago, Illinois, was a visitor recently. He reports that they will finish about April the 1st with their work on the Santa Fe, between Pampa and Cheyenne.

J. J. Donnelly, 4571 Oakland Avenue, St. Louis, Missouri, has idle a wheeler and fresno outfit and twelve teams and is looking for a job.

Pacific Coast Notes

BY F. L. BEST

Skousen Brothers, Silver City, New Mexico, were awarded contract by Arizona Highway Commission at $173,162.93 for highway construction consisting of 16.9 miles of roadway.

Marter & Bock, Los Angeles, report a record run by their Bucyrus-Erie B-2—370 truck loads averaging 3½ yards to the truck in 9 hours. Bob Shriver was superintendent of the job and C. Marshell was at the levers, Roy Moore keeping up steam. Actual working time was 8½ hours due to changing hoist cable.

Wheelwright Construction Co., Ogden, Utah, were awarded contract by Nevada Highway Department for reconstruction of 22.74 miles of road.

Crook & Henno, Los Angeles, have their Bucyrus-Erie 41-B on construction work in Arizona.

Carl Ingalls, Commercial Truck Co., Bakersfield, are putting a Bucyrus-Erie GA-2 on their work in the Kettlemen Hills District.

John C. Gist, Arcadia, submitted low bid to Orange County Supervisors for road construction in Brea Canyon involving 71,700 cubic yards. Mr. Gist will use two Bucyrus-Erie GA-2 machines on the job.

William Ruddock, Los Angeles, has purchased his third Bucyrus-Erie GA-2. The machines are on construction work for the General Petroleum Corporation at Santa Fe Springs. Operators: Roberts, Rives and Farrell.

Tompson Brothers, Fresno, California, have purchased a Bucyrus-Erie GA-2 for excavating work in and around Fresno.

J. G. Donovan and Son, Los Angeles, have submitted a low bid for constructing the Sepulveda Boulevard Tunnel under Mulholland Highway in Los Angeles, including 650 feet of concrete-lined tunnel and over 500,000 yards of excavation. Donovan & Son have two Gas + Air and three Type-B Bucyrus-Erie shovels which they will employ in this work.

A
SMOOTH
FIRM GRIP

No jerking or grabbing with *Asbesgraphite!* On shovels, dredges, draglines, cranes, hoists, pavers, trucks, etc., this Gatke product has proved its ability to give longer life, trouble-free service, and ability to speed up operations because of better and smoother control. Asbesgraphite is a self-lubricating, non-scoring asbestos friction material unaffected by heat, cold or moisture. It ends friction troubles.

You are missing a bet if your machines are not Asbesgraphite equipped. The cost of a trial installation is negligible. It's not an experiment, for we guarantee satisfactory service — *order today.*

It is not Asbesgraphite unless it is marked "GATKE"

ALL SIZES CARRIED IN STOCK

THOMAS L. GATKE

Manufacturer

Chicago Office: Railway Exchange Building
Factory: Winona Lake, Indiana

ASBESGRAPHITE
ASBESTOS GATKE COMPOSITION

In writing to Thomas L. Gatke please use post card bound in the center of this number.

R. C. Huffman Construction Company Operations

(Continued from page 149.)

Excavating for Approach to New Union Depot, Hamilton, Ontario.

Left: Fill for Canadian National Yards on Hamilton Bay Front. Center: Loading trucks with one of the Bucyrus-Erie one-yard Diesel draglines. Right: General view of cut operations, showing the two Diesel draglines working, one on each bank of the cut.

Trail which was built under the supervision of J. L. Delamere, who is the general superintendent in charge of all southern work. How the R. C. Huffman Construction Company handled the building of this 24 miles of the Tamiama Trail through the Everglades, using dredges and Bucyrus-Erie Diesel draglines in a battle against swamp, heat, fever, mosquitoes and hurricanes, is an epic in the annals of excavation.

Hamilton Job Handled in Unusual Manner

The present operations at Hamilton, Ontario, are of considerable interest, as an unusual method of handling has been developed. The work consists of 310,000 yards of excavation through the old business district of Hamilton to provide an approach for the new Union Depot. The work involves widening a cut 4,000 feet long, 250 feet wide, and 20 feet deep. The equipment being used consists of two Bucyrus-Erie one-yard Diesel draglines and one ¾-yard Northwest, these machines loading into ten trucks. The draglines remove the top surface, break out brickwork and concrete of the old basements, etc., after which a hydraulic gun, with a pressure of 225 pounds per square inch, is used to wash down the dirt, a loose, light soil which digs easily.

The gun washes the dirt into a sump whence it is pumped 4,500 feet to fill in for the Canadian National yards along Hamilton Bay. As the surface left by the hydraulic gun is irregular, it is necessary to use the draglines in a third or finishing operation to complete the grade and construct the specified slopes.

"My dear," called a wife to her husband in the next room, "what are you opening that can with?"

"Why," he said, "with a can-opener. What did you think I was doing it with?"

"Well," replied his wife, "I thought from your remarks you were opening it with a prayer."

"Hi, there," bellowed a policeman to an inebriated citizen, "you can't stand there in the street."

"Yes, I can, orfsher," retorted the citizen proudly. "Don't you worry 'bout me. I been standin' here an hour an' ain' fell off yet."

"Where'd you get that eye?"

"You know that pretty little woman we said was a widow?"

"Yes."

"Well, she isn't."

An Englishman was visiting this country for the first time, and as he was driving along the highway, saw a sign "Drive Slow. This means YOU!"

The Englishman stopped in surprise and exclaimed, "My word! How did they know I was here?"

Armstrong All Steel Blast Hole Drills

Are the choice of the country's largest producers of Limestone, Cement Rock, Trap Rock, Granite, Iron Ore, Lead and Copper.

Ten Outstanding Features — found only in Armstrong Blast Hole Drilling Equipment — insure more holes at a lower cost per foot. Write for "The Story of the Quarry".

See P. & Q. Handbook, page 71; 1928 Keystone Metal Quarry Catalog, page 160.

ARMSTRONG MFG. CO., 919 Chestnut Street Waterloo, Iowa, U. S. A.

KOHLER OF KOHLER

Electric Plants

Automatic — 110 Volt D. C.

— No Storage Batteries

Kohler Co., *Founded 1873*, Kohler, Wis.

Shipping Point, Sheboygan, Wis.

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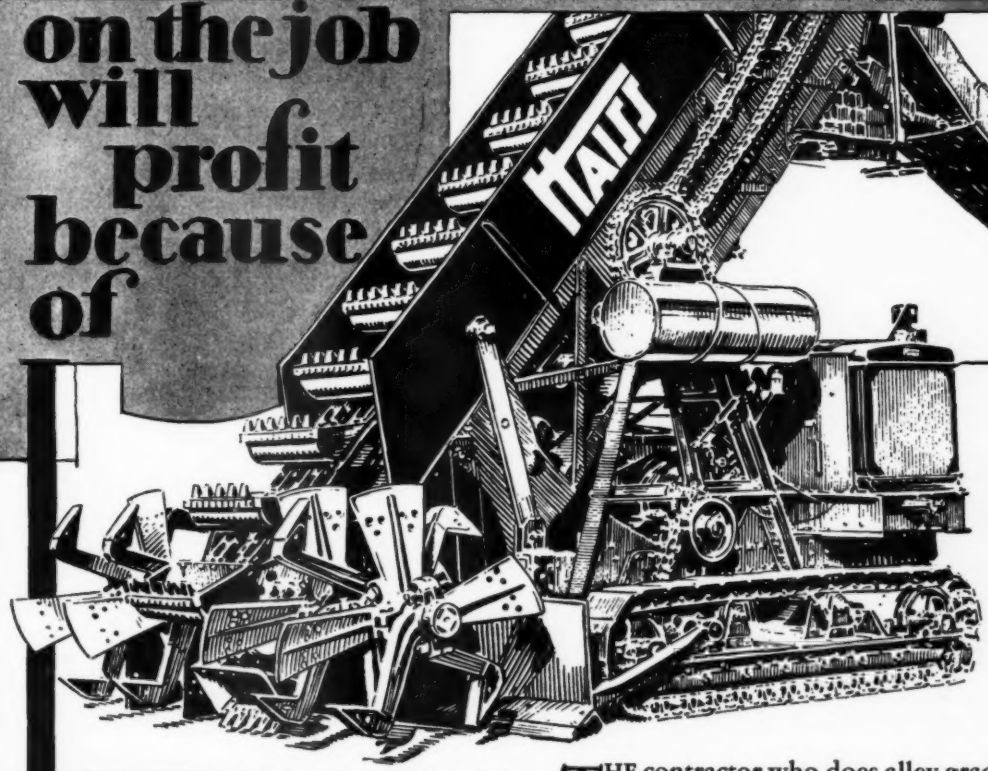
CONTINUOUS

The Man who puts HAISS EXCAVATORS on the job will profit because of



It's

THE contractor who does alley grading, road widening—all grading before the paver, stripping, and direct bank digging, can profit by using the Haiss Excavator's ability to Dig Continuously at 1¾ to 2 cubic yards per minute.

Ask for your copy of the new bulletin.

GEORGE HAISS MANUFACTURING CO., *Inc.*
144th Street and Park Ave. New York, N. Y.
Representatives in Principal Cities

CONTINUOUS DIGGING

In writing to Geo. Haiss Mfg. Co., Inc., please use post card bound in the center of this number.

Winning the Clay at Bohnsack Brick Plant

(Continued from page 157.)

Kiln Building at the Bohnsack plant.

plant is about 300,000 bricks per day with a capacity of 350,000.

Efficiency of Organization and Plant Design Notable Features

The visitor to the Bohnsack Brick Plant is struck by the efficiency of the operation. Waste motion has been eliminated throughout the plant, and delays have been guarded against in every possible way. The plant has been planned to handle the process of manufacture in a continuous stream at high speed in comparatively small quantities. Every machine is readily accessible where attention is required, each man is carefully trained, and the teamwork of the organization is distinctly noticeable.

The offices of the Bohnsack Brick Company are at 2032 Builders Building, 228 North La Salle Street, Chicago, Illinois. The plant is at Schiller Park, Illinois. Wm. G. Bohnsack is president of the company, Edwin H. Bohnsack is secretary, A. W. Bohnsack is vice-president, Louis Pfeifer, vice-president, and Wm. Carpenter is chief engineer.

View of the pit, showing incline passing track and loading track. A spring switch is used on the incline to send the empties around the loads.

Meeting Place of Capital and Labor

The **KOENIG LABOR AGENCIES**

Established 1875

ST. LOUIS
612 Walnut Street
Main 2766 and 2767

KANSAS CITY
501 Delaware Street
Main 0796

Help of All Kinds Furnished Free

Black Gum Rollers

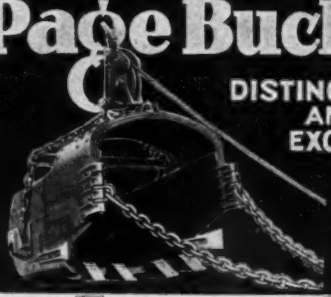
Standard dragline sound heart black gum rollers recommended by all contractors as superior to maple, at one-third the cost. Send us a trial order for a set, and be convinced. Used exclusively in all southern levee building on soft soil, which is a hard test on rollers. They have proven superior to all other materials.

Doherty-Walsh Roller Co.
Baton Rouge, Louisiana

Page Buckets

DISTINCTIVE AND EXCLUSIVE

Standard of the World



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DRAG SHOVELS – DRAG LINES – BUCKETS – SLACK LINES

TRADE NOTES

MYRON C. ATWOOD

Mr. Myron C. Atwood, President and General Manager of the Western Wheeled Scraper Company, died in his home city, Aurora, Illinois, February 26, 1929, after a lingering illness. His death will be widely mourned, as he was universally admired and loved by all who came in contact with him.

Like most strong men, he was country born, having come into the world in a farm home near Aurora, August 24, 1863. He received his early business training in railroad work, starting as ticket agent and operator for the Chicago, Burlington & Quincy Railroad at the early age of seventeen years. Through successive and well-earned promotions, he worked his way upward, occupying many responsible positions in the railroad world, and was recognized as an authority in matters pertaining to freight rates and classifications.

Myron C. Atwood

Probably for this reason, Captain Charles H. Smith, founder and then President of the Western Wheeled Scraper Company, sought him out in 1906 and made him his Assistant Manager. Upon the death of Captain Smith in 1910, Mr. Atwood was promoted to the position of General Manager. In 1925, upon the death of Judge W. I. Babb, who had succeeded Captain Smith as President, he became both President and General Manager, which responsible position he held with great ability until the end.

In the twenty-three years which he served as an executive of the Western Wheeled Scraper Company, Mr. Atwood saw the company grow into one of the largest industries of this kind in the world, whose products have carried the trade name "Western" into every civilized land. To the earth-moving contractors especially, his untimely death comes as a personal loss.

Bucyrus-Erie Company announces the moving of its Chicago district office to 105 West Adams Street, 1312 Bankers Building, Chicago, Illinois. The Bucyrus-Erie Company's complete line, including machines from one-half to sixteen cubic yards capacity—of every type of power—Gasoline, Gas + Air, Diesel, Diesel + Air, Diesel-electric, electric and steam —will be handled by A. R. Hance for machines larger than one and one-quarter yards, and by W. K. Fawcett for one and one-quarter-yard machines and smaller.

Of particular interest to the logging, contracting and lumbering industries is the recent consolidation of the Hoist and Lumber Carrier business of the Willamette Iron & Steel Works with the Ersted Manufacturing Company. By this grouping of interests two of the leading automotive hoist manufacturers come together for the purpose of better service to the trade. The new company, known as the **Willamette-Ersted Company,** is located at the plant formerly occupied by the Ersted Manufacturing Company at 29th and Clackamas Streets, Portland, Oregon, where a complete line of automotive hoists, automotive cranes and lumber carriers are being manufactured.

The combined companies have for many years been independently engaged in the manufacture of a complete line of hoists, cranes and lumber carriers, best known of which are the Ersted "Hyster," Ersted Automotive Hoist, Willamette Lumber Carriers and Willamette Hoists for the "Caterpillar" Tractor. This latter equipment has become standard for the "Caterpillar" to the extent that all authorized "Caterpillar" dealers act as selling agents for it.

The officers of the new organization are: C. F. Swigert, Chairman of the Board of Directors; E. G. Swigert, President, A. J. Ersted, Vice-President in charge of production; E. C. Pape, Vice-President in charge of sales; and H. Black, Secretary and Treasurer.

Whitcomb-Baldwin Alliance

Interest in the application of internal combustion engines in locomotive practice, received a further stimulus in the announcement last month that the Baldwin Locomotive Works of Philadelphia, Pennsylvania, one of the largest steam locomotive manufacturers in the world, had purchased a substantial interest in the business of the Geo. D. Whitcomb Company at Rochelle, Illinois.

The Geo. D. Whitcomb Company itself is an organization of fifty years standing, and has developed a complete line of gasoline, distillate, oil, and alcohol-burning locomotives for railway switching as well as industrial and contracting activities.

During the last five years, there has been an increasing demand to use internal combustion engines using gasoline, distillate and oil as fuel in the larger locomotives. While the 25-ton machine was considered a large unit five years ago in the gasoline field, the Geo. D. Whitcomb Company is now building straight gear-driven machines powered by gasoline, distillate and oil engines, in sizes up to fifty tons, developing drawbar pulls in low gear up to 25,000 pounds.

The Whitcomb Company has now developed gas and oil electric locomotives up to the 100-ton sizes, and can furnish the railways locomotives with a maximum drawbar pull of 50,000 pounds.

The Baldwin Locomotive Works has made an arrangement with the Geo. D. Whitcomb Company to sell the Whitcomb locomotives and products in practically all foreign countries through its own representatives, located in all parts of the world. An agreement has also been effected whereby the Baldwin Locomotive Works, through its domestic offices, will handle the railway field in the United States for the Geo. D. Whitcomb Company.

The alliance of these two corporations, who have been outstanding manufacturers in their particular lines in the locomotive industry for a great many years, is of great interest to the trade as it shows the trend, at least in the smaller sizes of 3 to 60 tons, to change from the formerly accepted standard, steam locomotives, to the more modern and economical unit, the gasoline, distillate and oil engine powered locomotives.

The combination of these two corporations puts them in a position to build every size of steam, gasoline, alcohol, distillate, Diesel, gas-electric or Diesel electric locomotive.

The Geo. D. Whitcomb Company has recently concluded an agreement for the use, as applied to its locomotives, of a gasifying device which admits of burning a low-grade fuel oil with a specific gravity as low as 32 degrees Be'. This new development shows a very substantial fuel saving that will be of interest to every prospective purchaser of locomotives, as the economy will approach that of the more expensive Diesel equipment. At the same time the first cost will be held down to figures that will not exceed, to any appreciable extent, the purchase price of straight gasoline powered locomotives.

POSITIONS WANTED

Space under this heading is available at $4.30 per inch or fraction thereof.

Shovel Operator

11 years' experience on Bucyrus 35-B, 80-B, 175-B, 320-B and 50-B at coal stripping and construction work. Would like a position on Bucyrus or Erie machine anywhere in the U. S. A. Can do all of his own repair work and furnish good reference. At present located in Indiana. Address Box 466, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Dragline Operator

3 years' experience on Bucyrus Diesel machine at road building and canal work. Would like a position anywhere in the U. S. A. Can do his own repair work and furnish good reference. At present located in Georgia. Address Box 459, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

18 years' experience on Bucyrus, Erie, Marion and Vulcan machine at railroad, mining and highway work. Would like a position on railroad construction work either in the Northwest or Cuba. Can do his own repair work and furnish good reference. At present located in North Carolina. Address Box 458, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Dragline and Clamshell Operator

7 years' experience on Erie Gas + Air and steam, also Osgood and Marion on grading work. Prefers a position on an Erie Gas + Air machine anywhere in the U. S. A. Can do his own repair work and furnish seven A-1 references. Now located in Iowa. Address Box 460, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

7 years' experience on Erie, Northwest, Bay City, Fairbanks, Marion and P. & H. machines at road, pit, basement and trench work. Wants a position on any kind of machine anywhere in the U. S. A. at road or pit work. Can do his own repair work and furnish the best of reference. At present located in Wisconsin. Address Box 467, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

20 years' experience on Bucyrus, Erie and Marion machines at road, basement and river work. Would like a position as engineer on a Bucyrus-Erie machine anywhere in the U. S. A. Can do his own repair work and furnish good reference. At present located in Indiana. Address Box 461, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Diesel Operator

15 years' experience on Bucyrus 50-B and 2 years on Marion Diesel on canal, reservoir and railroad work. Would like a position on a Bucyrus 50-B anywhere in the U. S. A. Can do all of his own repair work and furnish the very best of reference. Located in California. Address Box 462, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Bucyrus Shovel Operator

Two years' experience on Class-24, 80 and 50-B machines at road building and stripping work. Would like a position on either of the above machines in the U. S. A. or Mexico. Can furnish the best of reference and can do his own repair work. At present located in Alabama. Address Box 463, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Small Shovel Operator

10 years' experience on Bucyrus-Erie 50-B, 1030, Class-24, 100-B and Gas + Air machines, working on railroad, coal loading and highway work. Now desires a position of any kind on any type of machine any place in the U. S. A. Can furnish the best of reference and do his own repair work. At present located in Illinois. Address Box 464, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Small Shovel Operator

16 years' experience on Type A and B Erie and Type O Thew machines on drainage projects and road work. Will go anywhere and can give satisfaction on any small steam shovel job. Now located in Florida. Address Box 465, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Large Shovel Operator

20 years' experience on Erie, Wheeley and Marion machines at basement, road, coal stripping, city streets and quarry work. Would like a position on an Erie or Marion machine anywhere in the Central States. Can do his own repair work and furnish good reference. At present located in Ohio. Address Box 454, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

10 years' experience on Gas + Air and gas and steam machines on all different kinds of work. Can do his own repair work and furnish good reference. Wants a permanent position in West Virginia, where he is now located. Address Box 472, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Dragline Operator

3 years' experience on Bucyrus 30 and 50-B, P. & H. No. 700 dragline at ditch, canal, dike and road work. Will take a position anywhere in the U. S. A. Can do his own repair work and furnish good reference. At present located in Idaho. Address Box 468, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Bucyrus Dragline Operator

12 years' experience on Bucyrus 30-B, 50-B, Class-9¾ and 14 on canals, drainage and irrigation work. Would like a position on a Bucyrus 50-B in South America. Can do all of his own repair work and furnish three good references. At present located in Texas. Address Box 455, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Large Shovel Operator

12 years' experience on Erie, Bucyrus, Monighan and Marion working in gravel pits, levees and ditches. Will work anywhere in U. S. A. Can do his own repair work and furnish good reference. At present located in Indiana. Address Box 456, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

14 years' experience on Bucyrus, Monighan and Northwest machines. 42 years of age, married, and has working experience in rock excavation, drainage, gravel, pit and basement work. Will work anywhere in the U. S. A. Can do his own repair work and furnish good reference. At present located in Pennsylvania. Address Box 473, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

15 years' experience on Erie and Bucyrus machines at grade work. Wants a position on an Erie machine anywhere in the U. S. A. Can do his own repair work and furnish good reference. Located at present in Pennsylvania. Address Box 471, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

2 years' experience on Erie Type G-A 2 shovel at road construction work. Can do his own repair work and furnish good reference. Will work anywhere in the U. S. A. At present located in Pennsylvania. Address Box 470, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Shovel Operator

20 years' experience on all makes of Erie and Bucyrus machines at railroad, street, quarry and construction. Prefers a position on a Bucyrus machine in the Middle West. Can do his own repair work and furnish good reference. At present located in West Virginia. Address Box 457, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Large Shovel Operator

Operator on 100-B Bucyrus Electric or 360 Marion dragline electric, also Erie steam. I have 15 years' experience in shovel work in quarries, stripping and road work. Can do my own repair work and furnish good reference. Will work anywhere in the U. S. A. At present located in Pennsylvania. Address Box 453, % The Excavating Engineer, South Milwaukee, Wis. 1

Quarry Superintendent and Shovel Operator

15 years' experience as shovel operator and quarry superintendent. Thorough knowledge of stripping, drilling, blasting, crushing plants and maintenance of same. Good following, A-1 references. Located in Missouri. Address Box 451, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Diesel or Steam Operator

Diesel and steam dragline and shovel operator just off big irrigation job in Mexico. Prefer Bucyrus-Erie 50-B and would like to get on a Diesel machine. Can do own repair work, best reference furnished and will go anywhere. Address Box 474, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

Dragline Operator

10 years' experience as dragline operator on Bucyrus 30-B, 50-B and Class-14 — steam, gas, Diesel and electric power — on irrigation, drainage, railroad, construction, and so forth. Can do own repair work and will go anywhere in the U. S. A. Address Box 475, % The Excavating Engineer, South Milwaukee, Wisconsin. 1

POSITIONS OPEN

Dragline Operators

Single men for positions in Central and South America. Only those with experience in operating Diesel powered draglines need apply. Write fully, stating age and Diesel dragline experience, to: United Fruit Company, One Federal Street, Boston, Massachusetts. (Employment Dept.) 1

Steam Shovel Runners

Single men for positions in Central and South America. Prefer those with some experience in operating Diesel powered shovels. Write fully, stating age and experience in operating Steam and Diesel powered shovels, to: United Fruit Company, One Federal Street, Boston, Massachusetts. (Employment Department.) 1

Steady Job for Operator of Experience on Dragline

We have a steady position open for an operator experienced on a Bucyrus-Erie Class-14 steam dragline. All-year-round job assured a man with right qualifications. Write Carroll Brothers, Incorporated, Buffalo, New York. 1